

START

KAISER ENGINEERS HANFORD COMPANY
INVITATION FOR BID

Invitation No.: KEH-5162 (B-714)
Date Issued: June 22, 1989

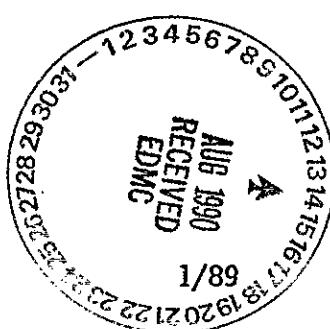
NAME AND LOCATION OF PROJECT: VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE, RICHLAND, WASHINGTON

The Work is divided into four phases, Phases I, II, III, and IV. Bidders are to provide a bid on each phase and to commit to the performance of each of them. The phases are to be commenced sequentially and each phase is to be commenced if and only if KEH issues the applicable Notice to Proceed in its sole and absolute discretion. If any Notice to Proceed is not issued, the successful bidder will only be entitled to the amount(s) it had bid on the phases for which Notice to Proceed has been given. Although the successful bidder is committed to performing each phase, Kaiser Engineers Hanford Company (hereinafter called "KEH") does not guaranty that all phases will be required by it.

1. **INVITATION - Step Two of Two-Step Sealed Bidding:** This invitation for bids is issued to initiate step two of two-step sealed bidding. The only bids that KEH may consider for award of a contract are those received from bidders that have submitted acceptable technical proposals in step one of the acquisition under the Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989. Bids will be received by KEH in accordance with the attachments hereto, for performing the Work as set out therein. The bidder shall comply with the contract specifications, drawings and bidder's technical proposal.
2. **BID FORM, CONTRACT DOCUMENTS:** Bids shall be submitted only on the attached Bid form, and shall be presented or mailed by the party executing it (hereinafter referred to as the "Bidder"). Attached to the Bid form are the Agreement, all documents referenced therein, the form of Bid Bond, Indemnity Agreement, and Site Stabilization Agreement. The documents that are attached to the Bid and the drawings listed in the Schedule of Drawings, together with any addenda, other bonds, or modifications, supplements, or amendments constitute the "Contract Documents" applicable to the proposed Work.
3. **PRESENTATION:** Bids must be sealed and presented or mailed with the cover conspicuously marked as follows:

"Sealed Bid" - Invitation No. KEH-5162 (B-714)

Kaiser Engineers Hanford Company
P. O. Box 888
Richland, Washington 99352
ATTN: Contract Placement Department"



Failure to do so may result in a premature opening of, or a failure to open, such bid.

4. **DUE DATE:** Bids will be received by KEH at above address until 2 p.m. local time on July 7, 1989 and opened publicly.
5. **WITHDRAWAL:** The Bid may be withdrawn by Bidder at any time prior to the time set for receipt of bids without prejudicing Bidder's right to file another bid, provided such other bid complies with this Invitation for Bid. Bids may be withdrawn by written or telegraphic request received from bidders prior to the time set for receipt of bids.
6. **REFERRALS:** Bids may only be submitted by Addressee of this Invitation for Bid.
7. **REJECTION:** Bids must be in exact accord with this Invitation for Bid. Accordingly, bids must conform to the essential terms of the Invitation for Bid and the Bid form. Bids that have been altered, modified, amended from the prescribed form, or are incomplete or conditional, or otherwise contain exceptions will be rejected. Bids are to be submitted by Bidder and will only be considered by KEH upon the express understanding that KEH reserves the right to (1) reject any or all bids, (2) waive irregularities therein, and (3) accept in KEH's absolute discretion any particular bid submitted by any Bidder, even though the price or completion date, or both, specified therein may not be as favorable as some other bid.
8. **RESPONSIBILITY:**
 - A. KEH will require evidence that the apparent successful bidder is responsible to transact business as a condition precedent to an award of the Work hereunder. The apparent successful bidder must:
 - (1) Have adequate financial resources to perform the Contract or the ability to obtain them;
 - (2) Be able to comply with the required or proposed delivery or performance schedule, taking into consideration all existing commercial and governmental business commitments;
 - (3) Have a satisfactory performance and safety record;
 - (4) Have a satisfactory record of integrity and business ethics;
 - (5) Have the necessary organization, experience, accounting, and operational controls, and technical skills, or the ability to obtain them (including, as appropriate, such elements as production control procedures, property control systems, and quality assurance measures applicable to materials to be produced or services to be performed by the prospective Bidder and Bidder's subcontractors);

- (6) Have the necessary production, construction, and technical equipment and facilities, or the ability to obtain them; and
- (7) Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

The apparent successful bidder will be required to submit a statement of facts under oath. Such statement must demonstrate to KEH's satisfaction that Bidder meets those standards KEH is otherwise unable to determine as acceptable. KEH will notify the apparent successful bidder which standards must be covered by the statement.

B. Bidder is advised now that the apparent successful bidder must submit a statement of facts that contains data about Bidder's safety performance. (In order to save time should Bidder be the apparent successful bidder, it may want to start gathering information relative to its safety record now.) This statement must include:

The Bidder's State Worker's Compensation Risk Classification, with the latest available corresponding merit ratings. These data will be evaluated and the Bidder will be found responsible for award of contract only if its average merit rating in the construction risk classifications is 115% or less. The foregoing data shall be submitted within seven (7) calendar days after oral notification from KEH that Bidder is the apparent successful bidder. If these data are not timely submitted or show the apparent successful bidder's average merit rating to be greater than 115%, the apparent successful bidder will be found nonresponsible and will not be awarded the contract.

Bidder's past work methods will also be assessed by a KEH review board for adherence to sound safety practices. Based on that assessment, a determination will be made whether the apparent successful bidder is found to be responsible for award of contract.

(Please note: All key contractor supervision of all contractors must have attended a safety qualification training session (either basic or annual refresher) within twelve months prior to the start of on-site work. No on-site work will be allowed without this training.)

C. Bidder is further advised that determination of the apparent successful bidder's quality responsibility may include a surveillance at the apparent successful bidder's facility to verify his ability to implement his Quality Assurance Plan.

9. **SITE VISITATION:** Bidder must visit the site of the Work and take such other steps as may be reasonably necessary to ascertain fully all pertinent conditions which may in any manner bear upon the performance of the Work and the price to be proposed for the performance thereof. Such conditions would include, but not be limited to, the location, accessibility and general character of the site, character and extent of existing work within or adjacent thereto, and other work being

performed therein. Failure to do so will not relieve bidders from responsibility for estimating properly the difficulty or cost of successfully performing the Work. KEH assumes no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of a contract unless included in this Invitation for Bid, the Drawings, or the Specifications. (Site inspection for KEH-5162 (B-714) was conducted May 17, 1989 during Step 1 of the Two-Step Bidding Process.)

10. **BID GUARANTEE:** Bid guarantee in a penal sum of not less than twenty percent (20%) of the bid price for Phases I, II, III, and IV will be required with each bid if the bid price is in excess of \$2,000.
 - (a) When a bid guarantee is required, failure to submit a bid guarantee in proper form and amount, by the time set for receipt of bids shall be cause for rejection. The Bidder, at its option, may furnish a bid bond, postal money order, irrevocable letter of credit, certified check, cashier's check, or may deposit, in accordance with Treasury Department regulations, certain bonds or notes of the United States as security in the amount required.
 - (b) If a bid bond is used for bid guarantee, it must be submitted on the form of Bid Bond.
 - (c) Bid guarantees other than bid bonds, will be returned to (1) unsuccessful Bidders as soon as practicable after the opening of bids and (2) the successful Bidder upon execution of such further contractual documents and bonds(including any necessary coinsurance or reinsurance agreements) as may be required by the accepted bid.
 - (d) If the successful Bidder fails to execute such further contractual documents and give such bond(s) (including necessary coinsurance or reinsurance agreements) required by the terms of the bid as accepted within the time specified after receipt of the forms by the Bidder, its contract may be terminated for default. In such event, the Bidder shall be liable for any cost of procuring the Work which exceeds the amount of its bid, and the bid guarantee shall be available toward offsetting such difference.
11. **INDEMNITY AGREEMENT:** Bidder understands and agrees that an indemnity agreement materially and substantially similar to the Indemnity Agreement attached to the Bid form must be executed as a part of the Contract.
12. **SITE STABILIZATION AGREEMENT:** Materials relating to a Site Stabilization Agreement for all construction work for the DOE at the Hanford Site is furnished with this Invitation for Bid. The Site Stabilization Agreement consists of a Basic Agreement dated September 10, 1984 plus appendices thereto. Effective March 1, 1987, KEH was recognized as the successor in interest to those rights, duties, and

obligations previously held by J. A. Jones Construction Services Company under the Site Stabilization Agreement.

The successful Bidder must become a signatory to the Site Stabilization Agreement (consisting of the Basic Agreement dated September 10, 1984 plus all current appendices at the time it executes the Agreement).

13. REVISION OF CONTRACT DOCUMENTS PRIOR TO RECEIPT OF BIDS: The right is reserved, as the interest of KEH may require, to revise or amend the Contract Documents prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by an addendum, or addenda, to this Invitation for Bid. Copies of such addenda, as may be issued, will be furnished to all prospective Bidders. If the revisions and amendments are of a nature which require material changes in quantities of prices bid, or both, the date set for bid opening will be postponed by such number of days as in the opinion of KEH will enable bidders to revise their bids. In such case, the addendum will include an announcement of the new date for opening bids.
14. EXPLANATIONS AND INTERPRETATIONS: Any explanation desired by a Bidder regarding the meaning or interpretation of the Invitation for Bid or any of the Contract Documents must be requested in writing to this office, Attention: Contract Placement Administrator, and with sufficient time allowed for a reply to reach bidders before the submission of their bids. Oral explanations or instructions given before the award of the contract will not be binding. Any interpretation made will be in the form of an addendum and will be furnished to all Bidders and its receipt by the Bidder must be acknowledged.
15. PREPARATION OF BIDS:
 - (a) Bids must be submitted on the forms furnished, or copies thereof, and must be manually signed. If erasures or other changes appear on the forms, each such erasure or change must be initialed by the person signing the Bid. Unless specifically authorized, telegraphic bids will not be considered.
 - (b) The form of Bid will provide for quotation of a price, or prices, for one or more items which may be lump sum bids, alternative prices, scheduled items resulting in a bid on a unit of construction or a combination thereof, etc. Where required on a Bid form, Bidders must quote on all items, and they are warned that failure to do so may disqualify the bid. When submission of a price on all items are not required, Bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.
 - (c) Alternate bids will not be considered unless called for.
 - (d) Modifications of bids already submitted will be considered if received at the place designated herein for the receipt of bids

by the time set for the receipt of bids. Telegraphic modifications will be considered. Telegraphic modifications shall not reveal the amount of the original or revised bid.

16. LATE BIDS, MODIFICATIONS OF BIDS, OR WITHDRAWAL OF BIDS: Bids received at the place designated in the Invitation for Bid after the exact time fixed for the receipt of bids will not be considered unless it is received in the office designated in the Invitation for Bid before award is made and either:

- (a) It was sent by registered or certified mail not later than the fifth (5th) calendar day prior to the date specified for the receipt of bids (e.g., a bid submitted in response to an Invitation for Bid requiring receipt of bid by the twentieth (20th) of the month must have been mailed by the fifteenth (15th) or earlier); or
- (b) It was sent by mail (or telegram if authorized) and it is determined by KEH that the late receipt was due solely to mishandling by KEH after receipt at the KEH installation.

Any modification or withdrawal of a bid is subject to the same conditions set out in the immediately preceding paragraph. A bid may also be withdrawn in person by a Bidder or his authorized representative, provided his identity is made known and he signs a receipt for the bid, but only if the withdrawal is made prior to the exact time set for receipt of bids.

The only acceptable evidence to establish the date of mailing of a late bid sent either by registered or certified mail is a U. S. Postal Service postmark on both the wrapper or envelope and on the original receipt from the U. S. Postal Service. If neither postmark shows a legible date, the bid, modification, or withdrawal, shall be deemed to have been mailed late. (The term "postmark" means a printed, stamped or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed on the date of mailing by employees of the U. S. Postal Service.)

The only acceptable evidence to establish the time of receipt at the KEH installation is the time/date stamp of such installation on the bid wrapper or other documentary evidence of receipt maintained by the installation.

Notwithstanding the above, a late modification of an otherwise successful bid which makes its terms more favorable to KEH will be considered at any time it is received and may be accepted.

NOTE: The term "telegram" includes mailgrams.

17. MULTIPLE BIDS: Except as provided in subparagraph (b)(3) of "Information Regarding Buy American Act" hereof, if more than one bid

is offered by any one party, by or in the name of its clerk, partner, or other person, all such bids will be rejected. A party who has quoted prices to a bidder is not thereby disqualified from quoting prices to other bidders, or from submitting a bid directly for the work.

18. AWARD OF CONTRACT: The contract will be awarded as soon as practicable to that responsible bidder, whose bid, conforming to the Invitation for Bid, is most advantageous to KEH, price and other factors considered.

In any event, the Contract will be awarded if at all, within sixty (60) days after the date presently set for receipt of bids (or as such date may be extended). KEH reserves the right to reject any or all bids, waive an informality in bids received when such waiver is in the interest of KEH and the Government. In case of error in the extension prices, the unit price will govern. KEH further reserves the right to accept or reject any or all items of any bid, unless precluded by the Invitation for Bids or the bidder includes in his bid a restrictive limitation; also to make an award to the bidder whose aggregate bid on any combination of bid items is low.

19. CONTRACT AND BONDS: The bidder whose bid is accepted shall, within the time established in the bid, enter into a written contract with KEH and, if required, furnish performance and payment bonds, on KEH standard forms. The bonds shall be in the amount indicated in Section 7 entitled "Bonding Requirements" of the Contract General Conditions.

20. NOTICE OF AFFIRMATIVE ACTION REQUIREMENTS: If the bid amount exceeds \$10,000 the bidder to whom award is made must comply with the requirements, terms and conditions of the Notice of Requirements of Affirmative Action to Ensure Equal Employment Opportunity (Executive Order No. 11246) as follows:

- (a) Bidder's attention is called to the Sections of the Contract General Conditions entitled "Equal Opportunity".
- (b) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for minority participation for each trade	Goals for female participation in each trade
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Until further notice	5.4%	6.9%
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- (c) These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted)

performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

- (d) The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity section, specific affirmative action obligations required by the specifications set forth in 41 CFR Part 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the Contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.
 - (e) The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs and to KEH within ten (10) working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number, estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
 - (f) As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is Benton County, Washington.
 - (g) Construction contractors which are participating in an approved Hometown Plan (see 41 CFR Part 60-4.5) (including the Southeastern Washington Hometown Plan) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA or EA goal established by the regulations of the Secretary of Labor.
21. WAGE RATES: The wage rates set out in General Wage Decision No. WA89-9 by the Secretary of Labor attached to the Contract General Conditions are the minimum rates which may be paid to the classifications of laborers and mechanics designated therein pursuant to the Davis-Bacon Act (Act of March 3, 1931, as amended: 40 U.S.C.

276a and following). KEH does not represent that said minimum wage rates do now, nor that they will at any time in the future, prevail in the locality of the work for such laborers and mechanics; nor that such mechanics or laborers are or will be obtainable at said rates for work under this contract; nor that said rates represent the most recent wage determinations by the Secretary of Labor with respect to such classifications of laborers or mechanics in the locality of the work.

22. INFORMATION REGARDING BUY AMERICAN ACT:

- (a) The Buy American Act (41 U.S.C. 10a-10d) generally requires that only domestic construction material be used in the performance of this Contract. (See the article entitled "Buy American Act" in the Contract General Conditions.)
- (b)
 - (1) Furthermore, bids or proposals offering use of additional non-domestic construction material may be acceptable for award if KEH determines that use of comparable domestic construction material is impracticable or would unreasonably increase the cost or that domestic construction material (in sufficient and reasonably available commercial quantities and of a satisfactory quality) is unavailable. Reliable evidence shall be furnished justifying such use of additional nondomestic construction material.
 - (2) Where it is alleged that use of domestic construction material would unreasonably increase the cost:
 - a. Data shall be included, based on a reasonable canvass of suppliers, demonstrating that the cost of each such domestic construction material would exceed by more than six percent (6%) the cost of comparable nondomestic construction material. (All cost of delivery to the construction site shall be included, as well as any applicable duty.)
 - b. For evaluation purposes, six percent (6%) of the cost of all additional nondomestic construction material, which qualified under paragraph a. above, will be added to the bid or proposal.
 - (3) When offering additional nondomestic construction material, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable, under (1) above, will cause rejection of the entire bid.
 - (4) The required data to justify use of additional nondomestic material must be submitted with the Bid.

23. ADDITIONAL INFORMATION: Bidders requesting additional information are advised to address their inquiries to:

Kaiser Engineers Hanford Company
P.O. Box 888
Richland, Washington 99352
Attention: Contracts Placement, Bldg. 1256

or by contacting M. A. Colby, Telephone No. (509)376-6370.

24. NOTICE OF POSSIBLE AVAILABILITY OF LOANS FOR BID AND PROPOSAL PREPARATION BY MINORITY BUSINESS ENTERPRISES SEEKING DOE CONTRACTS AND ASSISTANCE:

Section 211(e)(1) of the DOE Act (Public Law 95-91 as amended by Public Law 95-619) authorizes the Department of Energy (DOE) to provide financial assistance to minority business enterprises to assist them in their efforts to participate in DOE acquisition and assistance programs. Financial assistance is in the form of direct loans to enable the preparation of bids or proposals for DOE contracts and assistance awards, subcontracts with DOE operating contractors, and contracts with subcontractors of DOE operating contractors. The loans are limited to seventy-five percent (75%) of the costs involved. Availability of these loans is subject to annual appropriation of funds and the remaining availability of funds from such appropriations.

DOE does not warrant that such assistance can be made available in sufficient time to prepare a bid or proposal for this solicitation. Note, also, as a possible way to save time in the future, that the DOE loan program includes provisions for a preliminary review in advance of a specific loan request.

Information regarding loan availability, eligibility criteria, and how to apply may be obtained from:

San Francisco Operations Office, USDOE
1333 Broadway
Oakland, CA 94612
Attn: Minority Loan Program Office
(415)273-6403

25. ORDER OF PRECEDENCE:

For bidding purposes only, where discrepancies exist between the provisions of the Invitation for Bid, on the one hand, and the Contract General Conditions, Supplementary Conditions, and the Specifications or Drawings on the other hand, the Invitation for Bid shall govern.

26. SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN

If the contract resulting from this solicitation is expected to exceed \$1,000,000.00, Article 89 of the Contract General Conditions, entitled "Small Business and Small Disadvantaged Business Subcontracting Plan" and the enclosed Notice, entitled "Small Business and Small Disadvantaged Business Subcontracting Plan (Advertised)", are applicable.

KAISER ENGINEERS HANFORD COMPANY

By Jim Mortmire
for M. A. Colby
Contract Administrator

KAISER ENGINEERS HANFORD COMPANY

BID

Invitation No. KEH-5162 (B-714)
Date of Bid: _____

NAME AND LOCATION OF PROJECT: VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE, RICHLAND, WASHINGTON

This bid is hereby submitted by the undersigned Bidder to Kaiser Engineers Hanford Company (hereinafter called "KEH"), pursuant to KEH's Invitation for Bid dated June 22, 1989.

The Bidder represents and warrants that its representative has visited and has thoroughly investigated the site for the proposed Work (as defined in the Contract General Conditions), and without limitation, has ascertained fully all pertinent conditions which may in any manner bear upon the performance of the Work herein proposed and the compensation Bidder proposes therefor. Bidder acknowledges that it has received and understands the Contract Documents herein defined.

WORK TO BE PERFORMED

Bidder offers to perform the Work described in, and in strict accordance with, the attached Agreement and all documents incorporated therein by reference, the Indemnity Agreement, and form of Bid Bond, along with any addenda, other bonds, or modifications, supplements or amendments (herein all referred to as Contract Documents).

If the Bidder is successful and is awarded the Contract for the Work, it agrees to execute and return all applicable Contract Documents within seven (7) calendar days after receipt of them from KEH. The Contract Documents required to be executed and returned include: The Agreement, the Indemnity Agreement, and a Performance Bond and a Payment Bond in the penal sums indicated in the General Conditions with good and sufficient surety or sureties. In addition, Bidder shall become a signatory to the Site Stabilization Agreement.

The Work is divided into four phases, Phases I, II, III and IV. The work activities of each phase are listed in Paragraph 1.3.3, Section 01310, Division 1. The phases are to be commenced sequentially and each phase is to be commenced if and only if the applicable Notice to Proceed is given by the date established therefor. If any Notice to Proceed is not given, the Contractor is obligated only to complete the phase(s) on which it is then working. The Contractor is not obligated to perform the remaining phases and KEH is not obligated to pay for them.

The commencement of Phases II, III, and IV are dependent upon (1) additional funding being available when required and (2) the election of KEH, acting

in its sole and absolute discretion, to proceed. KEH makes no representation, commitment, or guaranty that funds will be available for Phases II, III, and IV, or that KEH will issue the Notices to Proceed with any such subsequent phase(s). (Refer to Paragraph 2.3 of the Supplementary Conditions for additional information.)

COMMENCEMENT AND COMPLETION

The Bidder agrees that if awarded the Contract, it will commence each phase of the work within ten (10) calendar days after the date of receipt of the applicable written notice to proceed. KEH will issue a separate notice to proceed for each of the four phases of work. The written notice to proceed will be deemed received five (5) calendar days after the mailing date, unless it is actually received by the bidder on an earlier date. The work shall be completed as follows:

<u>DESCRIPTION</u>	<u>COMPLETION DATE</u>
All Work of Phase I -	February 12, 1990
All Work of Phase II -	May 16, 1990
All Work of Phase III -	February 2, 1991
All Work of Phase IV -	April 18, 1991

The Contractor shall refer to the Critical Path Schedule for Construction of Vaults 102 through 105. In addition to completing the work of each phase by the completion date, the Contractor shall also complete each activity on the Critical Path Schedule that falls within such phase. The date by which each such activity must be completed is the date shown therefor on the Critical Path Schedule.

The term, "Contract Time," as used in the Contract Documents, shall refer to the completion date shown above for each phase and shall refer to the completion date shown for the activities on the Critical Path Schedule.

It is anticipated that the initial notice to proceed with the performance required by the terms of the Contract for Phase I will be issued not later than August 10, 1989, and the notices to proceed with the remaining phases will be issued within the following time frames:

<u>PHASE</u>	<u>NOT EARLIER THAN</u>	<u>NOT LATER THAN</u>
II	August 10, 1989	November 3, 1989
III	January 2, 1990	February 2, 1990
IV	October 1, 1990	October 15, 1990

NOTE: All dates specified for completion of the work are predicated on the notice to proceed with Phase I work being issued as anticipated. If

said notice is issued later than the anticipated date, an equitable adjustment will be made in each of the completion dates shown.

After contract award, the Contractor agrees to submit the following items pursuant to Section 55 of the General Conditions: Acceptable safety program, including job safety analysis; name of individual assigned to administer safety program; two years prior industrial injury/illness experience and construction equipment certifications. The Contractor's safety submittals must be acceptable to KEH prior to badging of personnel and/or commencement of any onsite work.

Delays caused by the Contractor's failure to submit an acceptable safety program in a timely manner shall not be an excusable delay under Section 21 of the General Conditions.

COMPENSATION

Bidder agrees to perform the Work for the following compensation (including all applicable State, Federal, and local sales, use, excise, business and occupation and transportation taxes and all other taxes pertaining to the transaction):

SCHEDULE OF BID ITEMS

<u>BID ITEM NO. 1:</u>	All Work of Phase I	\$ _____
<u>BID ITEM NO. 2:</u>	All Work of Phase II	\$ _____
<u>BID ITEM NO. 3:</u>	All Work of Phase III	\$ _____
<u>BID ITEM NO. 4:</u>	All Work of Phase IV	\$ _____
<u>TOTAL (Sum of Items No. 1, 2, 3 and 4):</u>		\$ _____

NOTES:

- A. Bidders must bid on all items.
- B. Subject to other terms and conditions of this Invitation for Bid, award will be made to the bidder whose bid results in the lowest combined total for Bid Items No. 1, 2, 3 and 4. However, bids that are obviously unbalanced (where price bid for an item does not bear a reasonable relationship to the cost of the work for such item) will be rejected.
- C. For bidding purposes, the Bidder may assume that the Phases of Work for which notices to proceed are issued will be performed in one continuous operation. (No wait between phases.)

KEH's obligation to pay the Contract Price for each phase in accordance with the foregoing is subject to the provisions and limitations set forth in Paragraph 2.3 of the Supplementary Conditions.

ADDENDA

Bidder acknowledges receipt of the following addenda. This Bid is submitted in full compliance with such addenda.

ADDENDA RECEIVED:

No.	Date	No.	Date
_____	_____	_____	_____
_____	_____	_____	_____

If no addenda are received state "NONE".

IRREVOCABLE OFFER

The foregoing offer shall be binding upon Bidder for Sixty (60) days after the date presently set for receipt of bids (or as such date may be extended), shall be irrevocable during that period and may be accepted at any time on or prior thereto.

BID GUARANTEE

Enclosed is a bid guarantee, consisting of _____, in the amount of \$_____. This amount is 20% of the total of Bid Items 1 through 4.

REPRESENTATIONS AND CERTIFICATIONS

The following Representations and Certifications are made by the Bidder:

1. CERTIFICATE OF INDEPENDENT PRICE DETERMINATION

(a) By submission of this bid each bidder certifies and in the case of a joint bid each party thereto certifies as to its own organization, that in connection with this procurement:

(1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor.

(2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly to any other bidder or to any competitor.

(3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition.

(b) Each person signing this bid certifies that:

(1) He is the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein and that he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above; or

(2) (i) He is not the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above, and as their agent does hereby so certify; and (ii) he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above.

(c) A bid will not be considered for award where (a)(1), (a)(3), or (b) above has been deleted or modified. Where (a)(2) above has been deleted or modified, the bid will not be considered for award unless the bidder furnishes with the bid a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

2. CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to (1) contracts, (2) subcontracts, and (3) agreements with applicants who are themselves performing federally assisted construction contracts, exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Article.)

By the submission of this bid, the bidder, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, applicant or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity Article in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, religion or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to

the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity article; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods);

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

A certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity article. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e. quarterly, semiannually, or annually).

3. CLEAN AIR AND WATER CERTIFICATION

(Applicable if the bid exceeds \$100,000, or KEH has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (41 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.).

The bidder certifies as follows:

- (a) Any facility to be utilized in the performance of this proposed contract () has, () has not, been listed on the Environmental Protection Agency list of violating facilities.
- (b) He will promptly notify KEH, prior to award, of the receipt of any communication from the Director, Office of Federal Activities, U. S. Environmental Protection Agency, indicating that any facility which he proposed to use for the performance of the contract is under consideration to be listed on the EPA list of violating facilities.
- (c) He will include substantially this certification, including this paragraph (c), in every nonexempt subcontract.

4. SMALL AND SMALL DISADVANTAGED BUSINESS CERTIFICATION

(Applicable if the bid exceeds \$10,000)

(a) The bidder certifies that its organization is () is not () a small business concern as defined in Section 3 of the Small business Act (15 U.S.C. 632 and SBA's rules and regulations set forth at 13 CFR 121.3-8). If an affirmative certification is made, the bidder shall complete the certifications at paragraph (b) of this section.

(b) The bidder certifies that its organization is a small business as set forth in paragraph (a) of this section and that it is () or is not () owned and controlled by socially and economically disadvantaged individuals. Such a firm is defined as one:

(1) which is at least fifty-one percent (51%) owned by one or more such individuals or, in the case of publicly owned business, at least fifty-one percent (51%) of the stock is owned by such individuals,

(2) whose management and daily business operations are controlled by one or more such individuals, and

(3) which certifies concerning said ownership and control is by the following: (i) United States citizens who are Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, or other specified minorities; or (ii) any other individual found to be disadvantaged pursuant to section 8(a) of the Small Business Act (15 U.S.C. 632).

Failure to execute all parts of the representation will be deemed a minor informality and the bidder shall be permitted to satisfy the requirement prior to award.

5. WOMEN-OWNED BUSINESS

The bidder represents that the firm submitting this bid () is, () is not, a women-owned business. A women-owned business is a business that is at least fifty-one percent (51%) owned by a woman or women who also control and operate the business. Control in this context means exercising the power to make policy decisions. Operate in this context means being actively involved in the day-to-day management.

For the purposes of this definition, businesses which are publicly owned, joint stock associations, and business trusts are exempted. Exempted businesses may voluntarily represent that they are or are not women-owned if this information is available.

6. EQUAL OPPORTUNITY REPRESENTATION

The bidder represents: (a) that he () has, () has not, participated in a previous contract or subcontract subject to either the Equal Opportunity Clause herein or the clause originally contained in Section 310 of Executive Order No. 10925; that he () has, () has not, filed all required compliance reports; and that representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards.

7. CONTINGENT FEE

The bidder represents: (a) that he () has, () has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract; and (b) that he () has, () has not, paid or agreed to pay to any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract, and agrees to furnish information relating to (a) and (b) above as requested by KEH. (Note: For interpretation of the representation, including the term "bona fide

employee", see Code of Federal Regulations, Title 41, Chapter 1, Subpart 1-1.5.)

8. PARENT COMPANY AND EMPLOYER IDENTIFICATION NUMBER

Each bidder will furnish the following information by filling in the appropriate blocks:

(a) Is the bidder owned or controlled by a parent company as described below?

Yes () No ()

(For the purpose of this bid, a parent company is defined as one which either owns or controls the activities and basic business policies of the bidder. To own another company means the parent company must own at least a majority (more than fifty percent (51%) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine or veto basic business policy decision of the bidder, such other company is considered the parent company of the bidder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements or otherwise.)

(b) If the answer to (a) above is "Yes" bidder will insert in the space below the name and principal office address of the parent company.

Name

Address

(c) Bidder will insert in the space(s) below the Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's quarterly Federal Tax Return, U. S. Treasury Department Form 941).

E.I. No. of Bidder _____

E.I. No. of Parent Company (if any) _____

9. TYPE OF BUSINESS ORGANIZATION REPRESENTATION

Business organization operates as an () individual, () partnership, () joint venture, () corporation, incorporated in the State of _____.

If partnership, give names of Partners:

Partner _____

Partner _____

10. COUNTRY OF MANUFACTURER

The product which the bidder proposes to furnish () is, () is not manufactured, mined, or grown in the United States. If the product is not manufactured, mined, or grown in the United States, the country of manufacturer is _____.

NOTE: The penalty for making false statement in bids is prescribed in 18 U.S.C. 1001.

11. CERTIFICATION REGARDING SUBCONTRACTING PLANS

Subcontracting Representation

(a) The bidder represents that the following conditions prevail which determine whether the firm shall be required to submit a subcontracting plan for small business concerns and small disadvantaged business concerns:

(1) he is a small business as defined in accordance with 13 CFR, Part 121 of the SBA regulations ();

(2) subcontracting possibilities are not offered with respect to this contract ();

(3) the contract is less than \$1,000,000.00 ().

(b) The bidder represents that he is not () required to submit plans for subcontracting with small and small disadvantaged businesses because he has properly executed one or more of the above representations.

(c) The bidder represents that he is not a small business as defined in accordance with 13 CFR, Part 121 of the SBA regulations and that a subcontracting plan will be submitted ().

IN WITNESS WHEREOF, This offer is executed and submitted this ____ day of _____, 19____.

(Print/Type Name of Bidder)

(Address)

By: _____
(Sign Name)

(Print/Type Name)

(Print/Type Title)

The individual executing this bid on behalf of the Bidder represents and warrants that he is authorized to do so and certifies under penalty of perjury that the Representations and Certifications are true, accurate, and complete to his best knowledge and belief.

Signed: _____

(Print/Type Name)

KAISER ENGINEERS HANFORD COMPANY

AGREEMENT

Contract No. KEH-5162 (B-714))
Date of Contract: _____

This Agreement is entered into pursuant to Contract No. DE-AC06-87RL10900 between Kaiser Engineers Hanford Company (KEH) and the Department of Energy whereby KEH has agreed to provide procurement and construction services required for work at the Hanford Site, Richland, Washington.

Kaiser Engineers Hanford Company and David A. Mowat Company hereby agree as follows:

CONTRACTOR'S OBLIGATIONS

Contractor shall perform faithfully all its obligations set out in this Agreement, in the documents listed below, in all documents referenced therein, and in all other Contract Documents (as defined in the Contract General Conditions), all of which are incorporated in this Agreement by this reference.

Contract General Conditions, dated November 1987, including General Wage Decision WA89-9, Modification No. 1, attached thereto.

Supplementary Conditions for KEH-5162 (B-714) dated May 5, 1989.

Specification No. B-714-C-2, Construction Specification for Vault Concrete Basin, Shell, and Leachate Sump for Grouted Waste Disposal Facilities Grouted Vault Pair (218-E-16), Revision 0, Latest Approval Date: 4-10-89.

Specification No. HS-BS-0015, Identification Methods, Revision C, Latest Approval Date: 10-9-87.

Schedule of Drawings for KEH-5162 (B-714) dated May 5, 1989.

Schedule of Permits for KEH-5162 (B-714), dated May 5, 1989

Addendum No. 1 - May 25, 1989
Addendum No. 2 - June 9, 1989
Addendum No. 3 - June 15, 1989
Addendum No. 4 - June 26, 1989
Addendum NO. 5 - June 30, 1989

WORK

The Contractor shall commence, perform, and complete the Work (as defined in the Contract General Conditions) pursuant to the Contract Documents and with due diligence in accordance with sound construction practice.

The Work is divided into four phases, Phases I, II, III and IV. The Work activities of each phase are listed in Paragraph 1.3.3., Section 01310, Division I. The phases are to be commenced sequentially and each phase is to be commenced if and only if the applicable Notice to Proceed is given by the date established therefor below. If any Notice to Proceed is not given by the date specified therefor, the Contractor is obligated to only complete the phase(s) on which he is then working; the Contractor is not obligated to perform the remaining phases. Similarly, KEH is only obligated to pay the Contract Price that is associated with each Phase for which a Notice to Proceed has been given.

CONTRACT TIME

The Contractor shall commence each phase of the work within ten (10) calendar days after receipt of the applicable written notice to proceed from KEH. KEH will issue a separate notice to proceed for each of the four phases of work. The written notice to proceed will be deemed received five (5) calendar days after mailing, unless it is actually received by the Contractor earlier. Offsite work shall commence as specified in the notice of award. The Contractor shall complete the work as follows:

<u>DESCRIPTION</u>	<u>COMPLETION DATE</u>
All Work of Phase I -	February 12, 1990
All Work of Phase II -	May 16, 1990
All Work of Phase III -	February 2, 1991
All Work of Phase IV -	April 18, 1991

The Contractor shall refer to the Critical Path Schedule for Construction of Vaults 102 through 105. In addition to completing the work of each phase by the completion date, the Contractor shall also complete each activity on the Critical Path Schedule that falls within such phase. The date by which each such activity must be completed is the date shown therefor on the Critical Path Schedule.

The term "Contract Time," as used in the Contract Documents, shall refer to the completion date shown above for each phase and shall refer to the completion date shown for the activities on the Critical Path Schedule.

It is anticipated that the initial notice to proceed with the performance required by the terms of the Contract for Phase I will be issued not later than August 10, 1989, and the notices to proceed with the remaining phases will be issued within the following time frames:

<u>PHASE</u>	<u>NOT EARLIER THAN</u>	<u>NOT LATER THAN</u>
II	August 10, 1989	November 3, 1989
III	January 2, 1990	February 2, 1990
IV	October 1, 1990	October 15, 1990

NOTE: All dates specified for completion of the work are predicated on the notice to proceed with Phase I work being issued as anticipated. If said notice is issued later than the anticipated date, an equitable adjustment will be made in each of the completion dates shown.

COMPENSATION: In consideration of the faithful performance of all of Contractor's obligations hereunder, KEH shall pay to Contractor the following compensation (including all applicable State, Federal, and local, sales, use, excise, business and occupation, and transportation taxes and all other taxes pertaining to the transaction):

SCHEDULE OF BID ITEMS

<u>BID ITEM NO. 1:</u>	All Work of Phase I	\$ 3,000,020.00
<u>BID ITEM NO. 2:</u>	All Work of Phase II	\$ 3,928,262.00
<u>BID ITEM NO. 3:</u>	All Work of Phase III	\$ 6,004,295.00
<u>BID ITEM NO. 4:</u>	All Work of Phase IV	\$ 984,556.00
<u>TOTAL</u> (Sum of Bid Items No. 1, 2, 3 and 4):		\$13,917,133.00

The term, "Contract Price", as used in the Contract Documents refer to the bid for each phase.

KEH's obligation to pay the Contract Price in accordance with the foregoing is subject to the provisions and limitations set forth herein and in Paragraph 2.3 of the Supplementary Conditions.

NOTICE

All notices, requests, demands, and other communications required or permitted to be given hereunder shall be in writing and shall be deemed to have been duly given if personally served or five (5) days after deposit in the United States mail, postage prepaid, certified, and addressed as follows:

ADDRESSES:

DAVID A. MOWAT COMPANY
P. O. Box 1201
Bellevue, Washington 98009
Attention: Mr. Tom Gaetz

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352
Attention: Mr. Ron Chapman

or to such other addresses as the parties may from time to time designate pursuant hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date of contract.

DAVID A. MOWAT COMPANY

KAISER ENGINEERS HANFORD COMPANY

By: _____

By: _____

Title: _____

Title: _____

SUPPLEMENTARY CONDITIONS

VAULT CONCRETE BASIN, SHELL AND LEACHATE SUMP FOR
GROUT WASTE DISPOSAL FACILITIES
200-EAST AREA
HANFORD SITE, RICHLAND, WASHINGTON

PART 1 - CONTRACT SPECIFICATIONS AND DRAWINGS

1.1 Fifteen (15) sets of the specifications and drawings will be furnished the Contractor without charge. Additional sets will be furnished on request at the cost of reproduction. Sets are available in the Contract Administration Manager's office of Kaiser Engineers Hanford Company, 801 First Street, Richland, Washington.

PART 2 - REVISION OF CONTRACT GENERAL CONDITIONS

2.1 Section 4, on Page 3

The following subsection is added to the Section:

"4.8 Certain areas on the construction drawings are indicated as on hold (shown encircled and with the words "Not Design Verified" and/or "Hold"). FOR BIDDING PURPOSES THE HOLDS SHALL BE DISREGARDED."

2.2 Section 8, on Page 3

In the third line, change "A.M. Best Rating of B+15" to read "A.M. Best Rating of B+XV".

2.3 Subsection 15, on Page 5

The following subsections are added to the Section:

"15.7 The Work is divided into Phases I, II, III and IV. The work activities of each phase are listed in Paragraph 1.3.3, Section 01310, Division 1. The Contractor's bid for each phase is set out in the Agreement and, for the purposes of this Contract, the term "Contract Price" refers to each bid for each phase. Provisions of this Contract relating to payment shall be interpreted to apply to the payment of the Contract Price for each phase and any conditions to any payment shall be applied relative to each phase.

15.7.1 The phases are to be commenced sequentially and each phase is to be commenced if and only if the applicable Notice to Proceed is given by the date established therefor in the Agreement.

15.7.2 If any Notice to Proceed is not given by the date specified therefor, the Contractor is obligated to only complete the phase(s) on which he is then working; the Contractor is not obligated to perform the remaining phases. Similarly, KEH is only obligated to pay the Contract Price that is associated with each Phase for which a Notice to Proceed has been given. There is no obligation of KEH under this Contract, or otherwise, under any theory or basis, to pay any sum whatsoever in excess of the Contract Price for each phase for which a Notice to Proceed has been given, any provision of this Contract to the contrary notwithstanding.

15.7.3 It is anticipated that the funds presently available will be sufficient for Phase I work. The commencement of Phases II, III, and IV are dependent upon (1) additional funding being available when required and (2) the election of KEH, acting in its sole and absolute discretion, to proceed. KEH makes no representation, commitment, or guaranty that funds will be available for Phases II, III, and IV, or that KEH will issue the Notices to Proceed with any such subsequent phase(s).

The Contractor understands and accepts the economic risk that KEH is not obligated in any manner whatsoever to issue any future Notices to Proceed and that if it does not issue any Notice to Proceed, Contractor will only be entitled to the Contract Price(s) associated with the phases completed and nothing further."

2.4 Subsection 27.2, on Page 10

In the third and fourth lines, the portion in parenthesis is changed to read "(consisting of a Basic Agreement dated September 10, 1984, plus all current Appendices thereto)".

2.5. Section 34, on Page 11

Add subsection 34.2 as follows:

"34.2 Purchase orders relating to Hanford work shall have the following designator:

'This order is priority rated DO-E-1 certified under DPS REG-1/DMS REG-1'."

2.6 Section 55, on Page 14

Add subsection 55.10 as follows:

"55.10 All key supervisory personnel of the Contractor must be qualified to site safety requirements and practices. The key supervisors must be so qualified prior to the start of any on-site work under this

Contract and must maintain their qualifications throughout the term of this Contract. Key supervisory personnel are defined as the on-site individuals in charge of and responsible for work at a specific location, plus the designated Safety representative.

Qualification is achieved by attendance at the basic safety training provided by KEH specifically for work at the Hanford Site. The training will consist of class room-type instruction and is anticipated to be 16 hours in length.

Qualification is maintained by attending the annual refresher program conducted by KEH."

2.7 Subsection 55.6, on Page 14

Change the first sentence to read as follows:

"The Contractor shall certify in writing that all construction equipment to be used in the performance of this contract complies with applicable OSHA/WISHA and ANSI requirements, and that their operators are qualified per ANSI B30.5 (5.3.1.2)."

2.8 Section 109, on Pages 29 and 30

2.8.1 In General

All references to "Appendix A" or "its Appendix A" in this section, are changed to read "all current Appendices thereto."

2.8.2 Subsection 109.1, on Page 29

In the fourth and fifth lines, "Basic Agreement plus Appendix A dated September 10, 1984" is changed to read "Basic Agreement dated September 10, 1984 plus all current appendices thereto."

PART 3 - CONTRACT MODIFICATION PROPOSAL PRICING

3.1 Contract modification proposal pricing shall be in accordance with the instructions and worksheets contained in Attachment A to these Supplementary Conditions.

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SCHEDULE OF DRAWINGS

Construction Drawings

<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
H-2-77573	Drawing List Area Map	0	3-30-89
<u>CIVIL</u>			
H-2-77574	Site Plan	0	1-20-89
H-2-77575 Sheet 1	Fnd Excavation & Diffusion Barrier	1	4-10-89
H-2-77575 Sheet 2	Fnd Excavation & Diffusion Barrier	1	4-10-89
H-2-77576	Diffusion Barrier & Initial Backfill	0	4-10-89
H-2-77578	Diffusion Barrier & Shielding Backfill	0	4-10-89
H-2-77580 Sheet 1	Concrete Vault Plan	0	4-10-89
H-2-77580 Sheet 2	Concrete Vault Section & Details	0	4-10-89
H-2-77580 Sheet 3	Concrete Vault Sections	0	4-10-89
H-2-77580 Sheet 4	Concrete Vault Section	0	4-10-89
H-2-77581 Sheet 1	Vault Roof Plan	0	4-10-89
H-2-77581 Sheet 2	Vault Roof Sections & Details	0	4-10-89
H-2-77582	Ext Drainage Path Plan Sect & Det	0	3-30-89

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<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
H-2-77583	Liner Plan Section & Details	0	4-6-89
H-2-77584	Vault Pit Plan Section & Details	0	1-20-89
H-2-77585	Vault Pit Details	0	1-20-89
H-2-77586 Sheet 1	Leachate Pit Plan Sections & Details	0	1-20-89
H-2-77586 Sheet 2	Leachate Pit Sections & Details	0	1-20-89
H-2-77587 Sheet 1	Penetration Plan Vault 102	0	1-20-89
H-2-77587 Sheet 2	Penetration Plan Vault 103	0	1-20-89
H-2-77590	Excess Water Pit Plan & Details	0	1-20-89
H-2-77591	Excess Water Pit Cover Blocks	0	1-20-89
H-2-77593 Sheet 1	Concrete Basin Plan	0	1-20-89
H-2-77593 Sheet 2	Concrete Basin Section & Details	0	1-20-89
H-2-77593 Sheet 3	Concrete Basin Section & Details	0	1-20-89

PIPING AND VESSELS

H-2-77596 Sheet 1	Piping Plan	0	1-20-89
H-2-77596 Sheet 2	Piping Plan Profile Grout Line	0	12-28-88
H-2-77597	Piping Miscellaneous Details	0	1-20-89

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<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
H-2-77598	Piping Support Plan	0	1-20-89
H-2-77599	Piping Support Details	0	12-28-88
H-2-77600	Jumper Arrgt Vault Pit	0	12-28-88
H-2-77601	Vault Pit Section & Details	0	12-28-88
H-2-77602 Sheet 1	Jumper Arrgt Excess Wtr Pump Pit	0	1-20-89
H-2-77602 Sheet 2	Jumper Arrgt Excess Wtr Pump Pit	0	1-20-89
H-2-77605 Sheet 1	Leachate Coll Sump Liner Plan, Sect, and Det	0	1-20-89
H-2-77605 Sheet 2	Leachate Coll Sump Liner Top View and Sect	0	1-20-89
H-2-77605 Sheet 3	Leachate Coll Sump Liner Details	0	12-28-88
H-2-77607	Expansion Void Details	0	12-28-88
H-2-77608	Drain Seal Assembly & Details	0	12-28-88
H-2-77609	Hose Handle Details	0	12-28-88
H-2-77610	Pit Cover Painting Diagrams	0	12-28-88
H-2-77611 Sheet 1	Piping Plan & Details	0	12-28-88
H-2-77611 Sheet 2	Piping Plan & Details	0	12-28-88
H-2-77612	Leachate Pump Pit Jmpr Arr/Jmpr Assy	0	1-20-89
H-2-77615	Piping Hydraulic Diagram	0	12-28-88

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<u>Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
<u>INSTRUMENTATION</u>			
H-2-77618 Sheet 1	Piping & Instrm Diagram Underground Vault	0	3-30-89
H-2-77618 Sheet 2	Piping & Instrm Diagram Underground Vault	0	3-30-89
H-2-77618 Sheet 3	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 4	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 5	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 6	Piping & Instrm Diagram Underground Vault	0	3-30-89
H-2-77618 Sheet 7	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 8	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 9	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 10	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 11	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77618 Sheet 12	Piping & Instrm Diagram Underground Vault	0	1-20-89
H-2-77619 Sheet 1	Instrm Vault MTD Instrm Instl Details	0	1-20-89
H-2-77619 Sheet 2	Instrm Vault MTD Level Assy	0	1-20-89

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<u>Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
H-2-77620 Sheet 1	Instm Vault MTD Instm T/C Assembly	0	1-20-89
H-2-77620 Sheet 2	Instm Vault MTD Instm T/C Assembly	0	1-20-89
H-2-77621 Sheet 1	Instm Cass Alarm Inter- face Connection Diagram	0	1-20-89
H-2-77621 Sheet 2	Instm Cass Alarm Inter- face Connection Diagram	0	1-20-89
<u>ELECTRICAL</u>			
H-2-77634	Electrical Site Plan	0	1-20-89
H-2-77635 Sheet 1	Electrical Vault Plan 218-E-16-102	0	4-10-89
H-2-77635 Sheet 2	Electrical Vault Plan 218-E-16-103	0	4-10-89
H-2-77636 Sheet 2	Elem & Conn Diag Vault 102	0	1-20-89
H-2-77636 Sheet 4	Elem & Conn Diag Vault 103	0	1-20-89
H-2-77637	Electrical Terminal Box Details	0	1-20-89
H-2-77638 Sheet 1	Electrical Manhole & Conduit Details	0	1-20-89
H-2-77638 Sheet 2	Electrical Manhole & Conduit Details	0	1-20-89
H-2-77638 Sheet 3	Electrical Manhole & Conduit Details	0	1-20-89
H-2-77639 Sheet 1	Electrical Leachate Con- trol Sta 102 Details	0	1-20-89

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<u>Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>	<u>Latest App. Date</u>
H-2-77639 Sheet 2	Electrical Leachate Control Sta 103 Details	0	1-20-89
H-2-77640	Electrical Elec Diag Leak Det Ann	0	1-20-89
H-2-77641	Electrical Wire Run List	0	1-20-89
H-2-77642 Sheet 1	Electrical Conn Schedule Vault 218-E-16-102	0	4-10-89
H-2-77642 Sheet 2	Electrical Conn Schedule Vault 218-E-16-103	0	4-10-89
H-2-77643 Sheet 1	Terminal Box Connection Diag	0	1-20-89
H-2-77643 Sheet 2	Electrical Annunciator Conn Diag	0	1-20-89
H-2-77645 Sheet 1	Cathodic Protection Plan	0	3-30-89
H-2-77645 Sheet 2	Cathodic Protection Plan	0	3-30-89
H-2-77646	Cathodic Protection Details	0	3-30-89
H-2-77647	Cathodic Protection Details	0	3-30-89
H-2-77648	Cathodic Protection Details	0	3-30-89

REFERENCE DRAWINGS (For Information Purpose Only)

<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>
SK-2-44557	Elec Cath Prot Test Wire Instl	2
H-2-3194	Standard Round Kick-off Plate for Male Purex Nozzles	10
H-2-30600	Std Square Kick-off Plate for Male Conn	9
H-2-57331	Mechanical Equip Details Short and Long Dowels	9
H-2-76455 Sheet 1	Civil Site Plan	1
H-2-77579 Sheet 1	Excavation Plan Vaults 102, 103, 104 and 105	0
H-2-77579 Sheet 2	Excavation Sections & Details	0
H-2-77588 Sheet 1	Vault Isolation Vault 102 Plan	0
H-2-77588 Sheet 2	Vault Isolation Vault 102 Penetrations	0
H-2-77588 Sheet 3	Vault Isolation Misc Details	0
H-2-77588 Sheet 4	Vault Isolation Vault 103 Plan	0
H-2-77588 Sheet 5	Vault Isolation Vault 103 Penetrations	0
H-2-77636 Sheet 1	Elem & Conn Diag Vault 102	0
H-2-77636 Sheet 3	Elem & Conn Diag Vault 103	0

No. KEH-5162 (B-714)
May 5, 1989

<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>
H-2-90161	Standard Rigid Lifting Bails	1
H-2-90185 Sheet 1	Male Nozzle 2" Purex	1
H-2-90185 Sheet 2	Male Nozzle 2" Purex	0
H-2-90504	Instm Cass Al Intfc Eqpt Arr	2
H-2-90507 Sheet 1	Instm Cass Al Intfc Conn Diag	2
H-2-98471 Sheet 1	Instm Cass Al Intfc Conn Diag	1
H-2-98473	Elec Site & Vault Plan & Details	1
H-2-98475 Shs. 2&3	Electrical Details	1
H-2-98477	Elec Wire Run List	1
H-2-98478 Shs. 1,2&3	Elec Connector Schedule	1
H-2-98479	Elec Cath Prot Test Wire Instl	1
H-2-98610	Elec Duct Bank Site Plan Layout	0
(No Number)	Vault Construction Sequence (8-1/2" x 11" Sketch)	0

No. KEH-5162 (B-714)
May 5, 1989

SCHEDULE OF PERMITS

PERMITS

- (1) Excavation Permit No. 88-164, for period 10-1-88 through 12-1-89.
- (2) Radiation Work Permit NO. 88-148 - This Permit is furnished as a sample permit for information only.
- (3) Also, refer to Section 01065 of DIVISION 1 - GENERAL REQUIREMENTS.

Appendix A

Special Contractor Requirements for Excavation Work.

1. The Onsite Construction Contractor (OCC) job superintendent, the excavation permit originator and the foreman of the construction forces actually performing the excavation (subcontractor, or Rockwell) walk the excavation site and review the excavation permit requirements before any excavation is initiated. A copy of the approved excavation permit is provided to the foreman.
2. The Onsite Construction Contractor Manager signs the excavation permit acknowledging concurrence with the permit instructions and verifying the site walk-through before any excavation is initiated.
3. The Onsite Construction Contractor superintendent, or designee, visits the excavation site as required to ensure that the construction forces are complying with the excavation permit requirements.
4. Each exposed underground facility is identified that it is the facility recorded on the drawing. If unidentified facilities are encountered, Process Engineering or the Facility Landlord are notified.
5. All known underground facilities located within the planned excavation are physically located by hand digging. Machine digging may be employed after underground facilities are located subject to limitations of excavation permit.
6. Before hand digging, notify all affected facilities and ensure that the following actions have been taken by plant forces:
 - a. Deactivate and tag all pressurized direct process or utility pipe lines within six feet of hand digging excavation.
 - b. Deactivate all radioactive pipe lines to be exposed by hand digging.
 - c. Lock, disconnect or blank and tag the sources of those deactivated pipe lines in accordance with RHO-MA-221, Vol. I, Accident Prevention Standards, Standard No. 7, "Lock and Tag."
7. The Rockwell Radiation Protection Technologist (RPT) is notified and requested to conduct a radiation survey of process pipes or encasements immediately after they are exposed. In addition, any unexplained moisture or chemical salts encountered in the ground are surveyed by the RPT for possible radioactivity.
8. All known underground facilities are conspicuously marked with large stakes or paint marks to warn equipment operators.
9. Bridging or shoring specified to protect exposed facilities shall be designed to meet WISHA or OSHA Standards. It shall be installed at the proper time to avoid damage to existing facilities that could result from slides, cave-ins, or other lack of support.

KAISER ENGINEERS
HANFORD

RADIATION WORK PERMIT

Contractor KEH	RWP Number 88-148	Work Order No. KEH5049	Valid Date FROM 6/10/88 - TO 6/10/89	Area 200E & W	Building N/A
-------------------	----------------------	---------------------------	---	------------------	-----------------

DESCRIPTION OF WORK/LOCATION

To perform industrial radiography operations for the KEH-5049 Steam System Rehabilitation, Phase I, Steam tie-line between 200E & 200W, using 100 Ci Ir-192 or 30 Ci Co-60 radioactive sealed sources.

RADIOGRAPHY TO BE PERFORMED BY PACIFIC TECHNICAL INDUSTRIES INC.

RADIOLOGICAL CONDITIONS:

Estimated Maximum Personnel Dose Rate: N/A mrad/Hour

Estimated Maximum Smearable Contamination: N/A Alpha Beta/Gamma

Estimated Maximum Airborne Radioactivity: N/A Alpha Beta/Gamma

PROTECTIVE CLOTHING & EQUIPMENT REQUIREMENTS

DOSIMETER	RESPIRATORY	FEET	HANDS	BODY	HEAD
<input type="checkbox"/> MP TLD	<input type="checkbox"/> Full Face	<input type="checkbox"/> Canvas Boots	<input type="checkbox"/> Canvas Gloves	<input type="checkbox"/> No Personal Outer	<input type="checkbox"/> Cap
<input type="checkbox"/> Self-Reading	<input type="checkbox"/> Fresh Air	<input type="checkbox"/> Shoe Covers	<input type="checkbox"/> Canners Gloves	<input type="checkbox"/> 1 Pr. Coveralls	<input type="checkbox"/> Hood
<input type="checkbox"/> Finger Ring	<input type="checkbox"/> Supplied Air	<input type="checkbox"/> Rubbers	<input type="checkbox"/> Surgeons Gloves	<input type="checkbox"/> 2 Pr. Coveralls	<input type="checkbox"/> Rubber
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> British Leggings	<input type="checkbox"/> Rubber Gauntlets	<input type="checkbox"/> Rubber Outer	<input type="checkbox"/> Plastic
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Leather	<input type="checkbox"/> Plastic Outer	<input type="checkbox"/> Face Shield

RADIATION MONITORING REQUIREMENTS

Continuous Intermittent Release Survey Of Personnel & Equipment Phone No. See Below

INSTRUCTIONS

1. Cognizant WHC operations personnel will require 24 hours advance notice of all KEH contractor radiographic operations.
2. KEH is responsible for assuring that contractor radiography operations are performed in a safe manner and in compliance with following:
 - * Applicable provision of the State of Washington requirements for Industrial Radiographic Operations Chapter 402-36-WAC.
 - * State of Washington Radioactive Materials License WN-IR053-1.
 - * Pacific Technical Industries Inc. OPERATING AND EMERGENCY PROCEDURES MANUAL FOR RADIOACTIVE MATERIALS USED BY PAC. TECH. IND. INC.
 - * An approved Radiation Shipment Report form must be available with the radiographic sealed source at all times.
3. Each radiographic area shall be established and controlled by Radiographer during time of exposure operations.
4. Each radiographic area shall be established and posted as follows:
 - a. Outer Boundary - 2mR/hr
 - * Yellow and magenta rope barricade
 - * Standard signs reading "CAUTION - RADIATION AREA - KEEP OUT" shall be placed at every reasonable avenue of approach

(Continued on next page)

Page 1 of 2

KEH APPROVALS

OPERATING CONTRACTOR APPROVAL

KEH RAD PROTECTION: John French

KEH CONT. ADMINISTRATION: M. Smith 6-10-88

PAC. TECH. IND. INC.: Verne Galanow

- b. Inner Boundary - 100mR/hr
 - * Yellow and magenta rope barricade
 - * Standard signs read "CAUTION - HIGH RADIATION AREA - KEEP OUT" shall be posted at every reasonable avenue of approach
 - c. A rotating red beacon, visable from every reasonable avenue of approach, shall be located at or near the source of radiation.
5. Posted radiographic areas shall not be left unattended and shall be under continuous surveillance during radiography.
6. Only persons authorized by the Radiographer shall enter posted areas. Any unauthorized person entering a posted area shall reported immediately to the KEH Radiation Protection Department and KEH Management.
7. Non-compliance with either the requirements of this procedure or the license requirements for, will result in the immediate shutdown of radiographic operations. No further work will be permitted until corrections are made.
8. Periodic unscheduled audits of radiographic operations will be made by the KEH Radiation Protection Department. Copies of the audit reports will be distributed to applicable people.
9. The KEH Radiation Protection Department shall be immediately notified of any:
 - * Entry into radiographic areas by unauthorized persons
 - * Suspected or known unplanned exposure to any person
 - * Loss of radiation generation devices or sealed sources while on the Hanford Project.
 - * Any reportable event required the KEH.
10. A minimum of two hours advance notice is required before performing any radiographic operations to the following:
- | | |
|--------------------------|--------|
| KEH Radiation Protection | 6-8215 |
| KEH Engineer | 3-3662 |
11. The below named individuals shall be notified immediately of any of the following:
 - * Suspected or unplanned radiation exposure to any person
 - * Off-scale pocket dosimeter
 - * Entry by unauthorized personnel into posted areas
 - * Loss of sealed source
 - * Suspected contamination of personnel or equipment

DJ Foust Work Phone: 376-8215 Home Phone: 547-4091
TL Morris 376-2235 946-5826

KAISER ENGINEERS HANFORD		RADIATION PROTECTION RECORDS STANDARD RADIOACTIVE SHIPMENT PROCEDURE		
Issued By KAISER ENGINEERS HANFORD	No. 88-04	Rev. No. 0	Valid From 6/10/88 To 6/10/89	
For The Shipment Of 100 Ci Ir-192 and 30 Ci Co-60 Radiographic Sources				
Between Richland and 200-E & 200W Areas				
THIS PROCEDURE CONSTITUTES A PASS FOR MOVEMENT OF THE ABOVE DESCRIBED RADIOACTIVE, UNCLASSIFIED MATERIALS BETWEEN ALL LIMITED AREAS WITHIN THE PLANT BOUNDARIES, INCLUDING THE 300 AREA, BUT DOES NOT CONSTITUTE A PASS FOR MOVEMENT OF THESE MATERIALS FROM THE 313 EXCLUSION AREA.				
Radiation Conditions 100 Ci Ir-192 and 30 Ci Co-60 Radiographic Sources				
Protective Clothing Requirements None				
Monitoring Requirements None				
Packaging Requirements As required by Pacific Technical Industries, Inc. Radiographic Safety Manual				
Special Instructions Source to be transported by Pacific Technical Industries, Inc. personnel				
Instructions <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> The shipment shall be marked with the radiation symbol, and stored in a radiation zone when not enroute. 2. <input type="checkbox"/> Preparation for shipment, loading and unloading shall be accomplished under RWP control. 3. <input checked="" type="checkbox"/> In case of accident or spill, notify RM immediately. 4. <input checked="" type="checkbox"/> Personnel Beta-Gamma badge dosimeter required. 5. <input type="checkbox"/> Other dosimeter required, type _____. 6. <input checked="" type="checkbox"/> A copy of this procedure shall accompany each shipment. 7. <input type="checkbox"/> Notify RM on arrival at destination. 8. <input type="checkbox"/> Vehicle shall be surveyed for contamination by RM before release. 9. <input checked="" type="checkbox"/> The shipment shall not be left unattended enroute. 				
APPROVALS				
Pacific Technical Industries, Inc. <i>Lou Salterman</i>				
KEH Contract Administrator <i>M. Danth</i> 6-10-88				
KEH Radiation Protection <i>David Hart</i>				
CHIEF PATROL: <i>MB Jaeger</i>				

KEH-1141.00

ACCEPTANCE TEST PROCEDURE NO. 4690

REV 0

DATE AUGUST 15, 1988

SUBJECT CATHODIC PROTECTION SYSTEM

LOCATION TGE AND VAULTS 218-E-16-101, 102, 103

PROJECT NUMBER B-714

WORK ORDER ER9090

PROJECT TITLE GROUT VAULT PAIR 218-E-16-102 AND 103

Prepared By

KAISER ENGINEERS HANFORD COMPANY
Richland, WashingtonFor the US Department of Energy
Contract DE-AC06-87RL10900TEST PROCEDURE APPROVED

Kaiser Engineers Hanford Company

A.R. Snowriter 2-1-89
 Originator Date

J.L. Minister 2/2/89
 Safety Date

J.E. Breed 2/3/89
 Quality Engineering Date

Robert B. Johnson 2-1-89
 Technical Documents Date

Alimadi P. Ray 2-2-89
 Environmental Date

Dale 2-3-89
 Project Manager Date

Westinghouse Hanford Company

J.R. Brum 3/14/89
 Projects Department Date

NA (See EOT) Date
 Safety

NA (See EOT) Date
 Quality Assurance

NA Date
 Operations

Willie L. Davis 3-20-89
 NACE Corrosion Specialist Date

PROCEDURE RELEASED

US Department of Energy (DOE)

NA (See EOT) Date
 Construction Division

TEST EXECUTION SHEET

TEST EXECUTION

Installation Contractor Date

Cathodic Protection Engineer Date

Recorder/Organization Date

Test Director/Organization Date

TEST WITNESS

Witness/Organization Date

Cathodic Protection Engineer Date

Witness/Organization Date

Witness/Organization Date

TEST ACCEPTANCE

Kaiser Engineers Hanford

Without
Exception

With
Exception/Resolved

With
Exception/Outstanding

Field Engineering Date

Cathodic Protection Engineer Date

Design Engineer (Author) Date

Project Engineer Date

TEST APPROVAL AND ACCEPTANCE

Westinghouse Hanford Company

Without
Exception

With
Exception/Resolved

With
Exception/Outstanding

(Title or Department) Date

Cathodic Protection Engineer Date

(Title or Department) Date

(Title or Department) Date

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ACCEPTANCE TEST PROCEDURE

GROUT VAULT PAIR 218-E-16-102 AND 103

WORK ORDER ER9090

1.0 PURPOSE OF THE ACCEPTANCE TEST

This acceptance test procedure (ATP) has been prepared to demonstrate that the cathodic protection system functions as intended by the design.

2.0 REFERENCE DRAWINGS AND SPECIFICATIONS

2.1 DRAWINGS

H-2-77645, Sheet 1 of 2	Electrical Cathodic Protection Plan
H-2-77645, Sheet 2 of 2	Electrical Cathodic Protection Plan
H-2-77646	Cathodic Protection Details
H-2-77647	Cathodic Protection Details
H-2-77648	Cathodic Protection Details

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the Recorder for listing on the Recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC CONSTRUCTION ENGINEER

- 3.1.1 Designate a Test Director.
- 3.1.2 Coordinate testing with TGE management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as approval has been obtained (one or more weeks prior to testing).
- 3.1.5 Schedule and conduct a pre-ATP kickoff meeting with test participants one or more weeks prior to start of testing.
- 3.1.6 Notify the persons performing and witnessing the test two days prior to the start of testing.

- 3.1.7 Obtain from Kaiser Engineers Hanford, Design Engineering, any information or changes necessary to clear or resolve objections.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.
- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which, in the judgment of the Director, may cause damage to the system until the test procedure has been revised.
- 3.2.4 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.5 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.6 Sign Test Execution Sheet when ATP has been performed.
- 3.2.7 Sign Exception Sheet when retest has been executed and accepted.
- 3.2.8 Obtain required signatures on the ATP Master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Execution Sheet as a Witness.
- 3.3.5 Sign Exception Sheet as a Witness when retest has been executed and accepted.

3.4 RECORDER (Provided by Kaiser Engineers Hanford)

- 3.4.1 Record names of all designated personnel on Recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests and record test data.
- 3.4.3 Sign the Test Execution Sheet as the Recorder.
- 3.4.4 Initial and date every test step on the Recorder's copy as it is completed, next to the step number or on a table, when provided. On tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.
- 3.4.5 Record objections or exceptions and test steps which are not performed on the Exception Sheet. Have the information transferred in ink or typed to the Master of the Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.6 Orally notify the Test Director at time the objection is made.
- 3.4.7 Assign page numbers to Data Sheets and Exception Sheets, after ATP is complete. Record page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.8 Transfer record changes and the final test results with Recorder's signature and dates for each step to the Master in ink or type. Submit the completed Master to the Test Director for approval signatures and distribution. Retain the Recorder's copy and a copy of the Master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test will be available at the start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the Construction Engineer those services, materials, or equipment that have been designated as being supplied by the DOE or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves and others from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all

activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in WHC-CM-4-3.

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

4.1 GENERAL

- Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with approved change control procedures and promptly accomplished.

5.0 TEST EXECUTION

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.
- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

Record the action taken to resolve each exception. Action taken may not be the same as planned action.

- 6.3.1 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.2 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4, below.

6.4 APPROVAL AND ACCEPTANCE

The client Project Engineer provides final approval and acceptance of exceptions by checking one of the following on Exception Sheet:

- 6.4.1 Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
- 6.4.2 Exception Accept-as-is: Requires detailed explanation.
- 6.4.3 Other: Requires detailed explanation.

The Project Engineer signs and dates the Exception Sheet and obtains other internal approvals, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

7.1 GENERAL

The following conditions shall exist at the start of the acceptance testing for that portion of the system being tested.

- 7.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

- 7.1.2 Continuity tests have been performed on portions of the electrical system being tested.
- 7.1.3 Power is available to components of systems being tested.
- 7.1.4 All test instruments have a valid calibration stamp attached that indicates a calibration traceable to the National Bureau of Standards.

7.2 EQUIPMENT REQUIRED

The Contractor shall supply all test equipment unless otherwise noted.

- 7.2.1 Multi-combination meter, portable, capable of measuring 2.0 mA to 20.0A dc and 2.0 mV to 100.0V dc (with minimum input impedance of 150,000 ohms/volt). Meter shall have a continuity check circuit and shall be capable of generating test current up to 2.0 amperes dc. Meter shall be M. C. Miller Model B3A1 or equal.
- 7.2.2 Volt-ohmmeter, portable, 0-150 volts ac/dc.
- 7.2.3 Clamp-on ac ammeter, 0-100 amps.
- 7.2.4 Test leads with insulated covers for wire clips.
- 7.2.5 Portable test reel, containing approximately 1,000 feet of test wire, 600 V, TW, #18 AWG.
- 7.2.6 Portable test reel, containing approximately 500 feet of test wire, 600 V, TW, #18 AWG.
- 7.2.7 Portable 100 amp test shunts, for use with multi-combination meter in paragraph 7.2.1 above.
- 7.2.8 Portable horizontal, copper-copper sulphate reference electrode.
- 7.2.9 Pipe locator.
- 7.2.10 Current interrupter, 3 amp/30 ampere capacity, Model No. CI-30 by Miller Co Inc.

8.0 RECTIFIER, ANODE JUNCTION BOXES, ANODE CABLES, ANODES, AND PIPE TEST CONDUCTORS

8.1 The following procedure will (1) verify the rectifier nameplate data and (2) verify that the anode header cables, anode loop cables, and negative return cable are connected as intended by the design.

8.1.1 Record the nameplate data for Rectifier No. R-33 located on the west side of the grout vault area.

Make : _____
Model No. : _____
Serial No. : _____
Volts ac : _____
Amps ac : _____
Phase : _____
Hertz : _____
Shunt Rating : _____
kW dc : _____
Volts dc : _____
Amps dc : _____
Oil Temp Max. : _____
Oil Capacity Max. : _____
Semiconductor Type: _____

8.1.2 Verify circuit breaker No. 9, in Distribution Panelboard D-PB-01, that supplies ac input power to rectifier No. R-33, is in off position.

8.1.3 Verify the rectifier case is filled with oil to the indicated level and that oil is clear.

8.1.4 Verify the ac wiring from Distribution Panelboard D-PB-01 is terminated on the ac input terminals of rectifier.

8.1.5 Verify the rectifier cables are properly labeled.

- a. (+) Anode Header Cable.
- b. (+L) Anode Loop Cable.

- _____ c. (-) Negative Return Cable.
 - _____ d. Input Power L1, L2, GND.
- _____ 8.1.6 Verify the anode header and anode loop cables are terminated at the rectifier positive terminals.
- _____ a. (+) Anode Header Cable.
 - _____ b. (+L) Anode Loop Cable.
- _____ 8.1.7 Verify the negative return cable (-) is connected to rectifier negative terminal.
- _____ 8.1.8 Verify the rectifier case is connected to the existing ground cable.
- 8.2 The following steps will verify that all cables in anode junction boxes are labeled and connected in accordance with the drawings and specification.
- _____ 8.2.1 Anode Junction Box AJB (45-1)
 - _____ a. (+W) Anode Header Cable - West.
 - _____ b. (+WL) Anode Loop Cable - West.
 - _____ 8.2.2 Anode Junction Box AJB (45-2)
 - _____ a. (+W) Anode Header Cable - West
 - _____ b. (+WL) Anode Loop Cable - West
 - _____ 8.2.3 Anode Junction Box AJB (45-3)
 - _____ a. (+W) Anode Header Cable - West
 - _____ b. (+WL) Anode Loop Cable - West
 - _____ 8.2.4 Anode Junction Box AJB (45-4)
 - _____ a. (+) Anode Header Cable
 - _____ b. (+L) Anode Loop Cable
 - _____ c. (+W) Anode Header Cable - West
 - _____ d. (+WL) Anode Loop Cable - West
 - _____ e. (+NE) Anode Header Cable - Northeast
 - _____ f. (+NEL) Anode Loop Cable - Northeast

- _____ g. (+SE) Anode Header Cable - Southeast
- _____ h. (+SEL) Anode Loop Cable - Southeast
- _____ 8.2.5 Anode Junction Box AJB (45-5)
 - _____ a. (+NE) Anode Header Cable - Northeast
 - _____ b. (+NEL) Anode Loop Cable - Northeast
- _____ 8.2.6 Anode Junction Box AJB (45-6)
 - _____ a. (+NE) Anode Header Cable - Northeast
 - _____ b. (+NEL) Anode Loop Cable - Northeast
- _____ 8.2.7 Anode Junction Box AJB (45-7)
 - _____ a. (+NE) Anode Header Cable - Northeast
 - _____ b. (+NEL) Anode Loop Cable - Northeast
- _____ 8.2.8 Anode Junction Box AJB (45-8)
 - _____ a. (+SE) Anode Header Cable - Southeast
 - _____ b. (+SEL) Anode Loop Cable - Southeast
- _____ 8.2.9 Anode Junction Box AJB (45-9)
 - _____ a. (+SE) Anode Header Cable - Southeast
 - _____ b. (+SEL) Anode Loop Cable - Southeast
- _____ 8.2.10 Anode Junction Box AJB (45-10)
 - _____ a. (+SE) Anode Header Cable - Southeast
 - _____ b. (+SEL) Anode Loop Cable - Southeast
- _____ 8.3 The following steps will verify continuity of the anode header cables and the anode loop cables.
 - _____ 8.3.1 Verify circuit breaker No. 9 in Distribution Panelboard D-PB-01, is in the OPEN position.
 - _____ 8.3.2 Verify no dc voltage at rectifier output terminals.
 - _____ 8.3.3 Disconnect anode header cable (+) and anode loop cable (#L) at rectifier terminals.

- _____ 8.3.4 Disconnect the following cables from terminals in anode junction box AJB (45-4).
- _____ a. (+SE) Anode Header Cable
 - _____ b. (+SEL) Anode Loop Cable
 - _____ c. (+NE) Anode Header Cable
 - _____ d. (+NEL) Anode Loop Cable
- _____ 8.3.5 Disconnect anode header cable (+W) and anode loop cable (+WL) in anode junction box AJB (45-1).
- _____ 8.3.6 Using a VOM, verify no continuity across anode header cable (+W) and anode loop cable (+WL) in anode junction box AJB (45-1).
- 8.3.6.1 Record the following VOM data:
- _____ a. Manufacturer: _____
 - _____ b. Model: _____
 - _____ c. Serial Number: _____
 - _____ d. Calibration Sticker Data: _____
- _____ 8.3.7 Connect anode header cable (+) and anode loop cable (+L) together at rectifier terminal.
- _____ 8.3.8 Using a VOM, verify continuity across anode header cable (+W) and anode loop cable (+WL), in anode junction box AJB (45-1).
- _____ 8.3.9 Reconnect cables disconnected in step 8.3.5.
- _____ 8.3.10 Disconnect anode header cable (+) and anode loop cable (+L) at rectifier terminal.
- _____ 8.3.11 Disconnect anode header cable (+W) and anode loop cable (+WL) and reconnect anode header cable (+NE) and anode loop cable (+NEL) in anode junction box AJB (45-4).
- _____ 8.3.12 Disconnect anode header cable (+NE) and anode loop cable (+NEL) in anode junction box AJB (45-7).
- _____ 8.3.13 Using a VOM, verify no continuity across anode header cable (+NE) and anode loop cable (+NEL) in anode junction box AJB (45-7).
- _____ 8.3.14 Connect anode header cable (+) and anode loop cable (+L) together at rectifier terminal.

- _____ 8.3.15 Using a VOM, verify continuity across anode header cable (+NE) and anode loop cable (+NEL), in anode junction box AJB (45-7).
- _____ 8.3.16 Reconnect cables disconnected in step 8.3.12.
- _____ 8.3.17 Disconnect anode header cable (+) and anode loop cable (+L) at rectifier terminal.
- _____ 8.3.18 Disconnect anode header cable (+NE) and anode loop cable (+NEL) and reconnect anode header cable (+SE) and anode loop cable (+SEL) in anode junction box AJB (45-4).
- _____ 8.3.19 Disconnect anode header cable (+SE) and anode loop cable (+SEL) in anode junction box AJB (45-10).
- _____ 8.3.20 Using a VOM, verify no continuity across anode header cable (+SE) and anode loop cable (+SEL) in anode junction box AJB (45-10).
- _____ 8.3.21 Connect anode header cable (+) and anode loop cable (+L) together at rectifier terminal.
- _____ 8.3.22 Using a VOM, verify continuity across anode header cable (+SE) and anode loop cable (+SEL) at anode junction box AJB (45-10).
- _____ 8.3.23 Reconnect cables disconnected in step 8.3.19.
- _____ 8.3.24 Reconnect anode header cables (+W) and (+NE) and anode loop cables (+WL) and (+NEL) in anode junction box AJB (45-4).
- 8.4 This procedure will verify that pipe test conductors are terminated on the designated terminals in each test station and are labeled correctly with the pipe number or reference electrode number. Typewritten tubular plastic wiremarkers designating protected pipes must be installed on conductors marked with either red or white tape. Typewritten tubular plastic wiremarkers designating reference electrodes must be installed on conductors marked with green tape. Typewritten tubular plastic wiremarkers designating unprotected pipes, if any, must be installed on conductors marked with blue tape.
 - _____ 8.4.1 Verify that Rectifier R-33 input circuit breaker is open.
 - _____ 8.4.2 Verify that all wires are terminated in accordance with applicable drawings and specification in the following listed test stations. Record the terminal number to which each conductor is connected.
 - _____ 8.4.2.1 Test Station T(45-1)
 - _____ 3"-H-C2-P01 Terminal No. _____
 - _____ Reference Electrode RE(45-1) Terminal No. _____

8.4.2.2 Test Station T(45-2)

_____ 8"-V-S6-P05 Terminal No. _____

_____ Reference Electrode RE(45-2) Terminal No. _____

8.4.2.3 Test Station T(45-3) deleted

8.4.2.4 Test Station T(45-4)

_____ 8"-V-S6-P05 Terminal No. _____

_____ Reference Electrode RE(45-4) Terminal No. _____

8.4.2.5 Test Station T(45-5A)

_____ 1"-H-S2-P03 Terminal No. _____

_____ 1"-A-C3-P19 Terminal No. _____

_____ 2"-S1 (Spare) Terminal No. _____

_____ 2"-H-C2-P08 Terminal No. _____

_____ 1"-F-S1-P03 Terminal No. _____

_____ 2"-F-S1-P02 Terminal No. _____

_____ Reference Electrode RE(45-5A) Terminal No. _____

_____ Reference Electrode RE(45-5B) Terminal No. _____

8.4.2.6 Test Station T(45-5B)

_____ 3"-H-C2-P01 Terminal No. _____

_____ 2"-S1 (Spare) Terminal No. _____

_____ 2"-H-S5-P01 Terminal No. _____

_____ 1"-F-S1-P14 Terminal No. _____

_____ 2"-F-S1-P04 Terminal No. _____

_____ C4 X 5.4 Channel Terminal No. _____

_____ Reference Electrode RE(45-5C) Terminal No. _____

8.4.2.7	Test Station T(45-6)	
	1"-S-C8-P02	Terminal No. _____
	Reference Electrode RE(45-6)	Terminal No. _____
8.4.2.8	Test Station T(45-7)	
	3"-H-C2-P01	Terminal No. _____
	Reference Electrode RE(45-7)	Terminal No. _____
8.4.2.9	Test Station T(45-8)	
	3"-H-C2-P01	Terminal No. _____
	Reference Electrode RE(45-8A)	Terminal No. _____
	3"-H-C2-P01	Terminal No. _____
	Reference Electrode RE(45-8B)	Terminal No. _____
8.4.2.10	Test Station T(45-9)	
	2"-G-001-M25	Terminal No. _____
	2"-W-C1-P01	Terminal No. _____
	Reference Electrode RE(45-9)	Terminal No. _____
8.4.2.11	Test Station T(45-10)	
	2"-EW-002-M25	Terminal No. _____
	3"-H-C2-P01	Terminal No. _____
	2"-W-C1-P01	Terminal No. _____
	Reference Electrode RE(45-10A)	Terminal No. _____
	Reference Electrode RE(45-10B)	Terminal No. _____
8.4.2.12	Test Station T(45-11)	
	2"-EW-002-M25	Terminal No. _____
	2"-G-001-M25	Terminal No. _____
	Reference Electrode RE(45-11)	Terminal No. _____

8.4.2.13 Test Station T(45-12)

_____ 3"-H-C2-P01 Terminal No. _____
_____ 2"-G-001-M25 Terminal No. _____
_____ Reference Electrode RE(45-12) Terminal No. _____

8.4.2.14 Test Station T(45-13)

_____ 2"-G-001-M25 Terminal No. _____
_____ 2"-EW-002-M25 Terminal No. _____
_____ Reference Electrode RE(45-13) Terminal No. _____

8.4.2.15 Test Station T(45-14)

_____ 2"-G-001-M25 Terminal No. _____
_____ Reference Electrode RE(45-14) Terminal No. _____

8.4.2.16 Test Station T(45-15)

_____ 2"-G-001-M25 Terminal No. _____
_____ Reference Electrode RE(45-15) Terminal No. _____

8.4.2.17 Test Station T(45-16)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-16) Terminal No. _____

8.4.2.18 Test Station T(45-17)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-17) Terminal No. _____

8.4.2.19 Test Station T(45-18)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-18) Terminal No. _____

8.4.2.20 Test Station T(45-19)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-19) Terminal No. _____

8.4.2.21 Test Station T(45-20)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-20) Terminal No. _____

8.4.2.22 Test Station T(45-21)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-21) Terminal No. _____

8.4.2.23 Test Station T(45-22)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-22) Terminal No. _____

8.4.2.24 Test Station T(45-23)

_____ 2"-GR-200-M25 Terminal No. _____
_____ 2"-EW-201-M25 Terminal No. _____
_____ Reference Electrode RE(45-23) Terminal No. _____

8.4.2.25 Test Station T(45-24)

_____ Leachate Tank 101A Terminal No. _____
18" Riser Pipe No. 1
_____ Leachate Tank 101A Terminal No. _____
18" Riser Pipe No. 2
_____ Leachate Tank 101A Terminal No. _____
4" Riser Pipe
_____ Reference Electrode RE(45-24) Terminal No. _____

8.4.2.26 Test Station T(45-25)
_____ 2"-EW-202-M25 Terminal No. _____
_____ 2"-GR-203-M25 Terminal No. _____
_____ Reference Electrode RE(45-25) Terminal No. _____

8.4.2.27 Test Station T(45-26)
_____ 2"-EW-202-M25 Terminal No. _____
_____ 2"-GR-203-M25 Terminal No. _____
_____ Reference Electrode RE(45-26) Terminal No. _____

8.4.2.28 Test Station T(45-27)
_____ 2"-EW-202-M25 Terminal No. _____
_____ 2"-GR-203-M25 Terminal No. _____
_____ Reference Electrode RE(45-27) Terminal No. _____

8.4.2.29 Test Station T(45-28)
_____ 2"-EW-202-M25 Terminal No. _____
_____ 2"-GR-203-M25 Terminal No. _____
_____ Reference Electrode RE(45-28) Terminal No. _____

8.4.2.30 Test Station T(45-29)
_____ 2"-EW-202-M25 Terminal No. _____
_____ 2"-GR-203-M25 Terminal No. _____
_____ Reference Electrode RE(45-29) Terminal No. _____

8.4.2.31 Test Station T(45-30)
_____ Leachate Tank 102A Terminal No. _____
24" Riser Pipe
_____ Reference Electrode RE(45-30) Terminal No. _____

8.4.2.32 Test Station T(45-31)
_____ Leachate Tank 103A Terminal No. _____
24" Riser Pipe

_____ Reference Electrode RE(45-31) Terminal No. _____

8.4.3 Using multicombo meter, measure and record the resistance between all RED and WHITE marked conductors that are identified as being connected to the same protected pipe. Also, measure and record resistance between BLUE marked conductors, if any, which are identified as being connected to the same unprotected pipe. Resistance measured shall be less than 1.0 ohm.

8.4.3.1 Record the following multicombo meter data:

- _____ a. Manufacturer: _____
_____ b. Model: _____
_____ c. Serial Number: _____
_____ d. Calibration Sticker Data: _____

8.4.3.2 Test Station T(45-1)

_____ 3"-H-C2-P01

8.4.3.3 Test Station T(45-2)

_____ 8"-V-S6-P05

8.4.3.4 Test Station T(45-3) deleted

8.4.3.5 Test Station T(45-4)

_____ 8"-V-S6-P05

8.4.3.6 Test Station T(45-5A)

_____ 1"-H-S2-P03

_____ 1"-A-C3-P19

_____ 2"-S1 (Spare)

_____ 2"-H-C2-P08

_____ 1"-F-S1-P03

_____ 2"-F-S1-P02

_____ 8.4.3.7 Test Station T(45-5B)

_____ 3"-H-C2-P01
_____ 2"-S1 (Spare)
_____ 2"-H-S5-P01
_____ 1"-F-S1-P14
_____ 2"-F-S1-P04
_____ C4 X 5.4 Channel

_____ 8.4.3.8 Test Station T(45-6)

_____ 1"-S-C8-P02

_____ 8.4.3.9 Test Station T(45-7)

_____ 3"-H-C2-P01

_____ 8.4.3.10 Test Station T(45-8)

_____ 3"-H-C2-P01
_____ 3"-H-C2-P01

_____ 8.4.3.11 Test Station T(45-9)

_____ 2"-G-001-M25
_____ 2"-W-C1-P01

_____ 8.4.3.12 Test Station T(45-10)

_____ 2"-EW-002-M25
_____ 3"-H-C2-P01
_____ 2"-W-C1-P01

_____ 8.4.3.13 Test Station T(45-11)

_____ 2"-EW-002-M25
_____ 2"-G-001-M25

- 8.4.3.14 Test Station T(45-12)
_____ 3"-H-C2-P01
_____ 2"-G-001-M25
- 8.4.3.15 Test Station T(45-13)
_____ 2"-G-001-M25
_____ 2"-EW-002-M25
- 8.4.3.16 Test Station T(45-14)
_____ 2"-G-001-M25
- 8.4.3.17 Test Station T(45-15)
_____ 2"-G-001-M25
- 8.4.3.18 Test Station T(45-16)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- 8.4.3.19 Test Station T(45-17)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- 8.4.3.20 Test Station T(45-18)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- 8.4.3.21 Test Station T(45-19)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- 8.4.3.22 Test Station T(45-20)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25

- _____ 8.4.3.23 Test Station T(45-21)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- _____ 8.4.3.24 Test Station T(45-22)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- _____ 8.4.3.25 Test Station T(45-23)
_____ 2"-GR-200-M25
_____ 2"-EW-201-M25
- _____ 8.4.4.26 Test Station T(45-24)
_____ Leachate Tank 101A, 18" Riser Pipe No. 1
_____ Leachate Tank 101A, 18" Riser Pipe No. 2
_____ Leachate Tank 101A, 4" Riser Pipe
- _____ 8.4.5.27 Test Station T(45-25)
_____ 2"-GR-203-M25
_____ 2"-EW-202-M25
- _____ 8.4.6.28 Test Station T(45-26)
_____ 2"-GR-203-M25
_____ 2"-EW-202-M25
- _____ 8.4.7.29 Test Station T(45-27)
_____ 2"-GR-203-M25
_____ 2"-EW-202-M25
- _____ 8.4.8.30 Test Station T(45-28)
_____ 2"-GR-203-M25
_____ 2"-EW-202-M25

_____ 8.4.9.31 Test Station T(45-29)

_____ 2"-GR-203-M25

_____ 2"-EW-202-M25

_____ 8.4.10.32 Test Station T(45-30)

_____ Leachate Tank 102A, 24" Riser Pipe

_____ 8.4.11.33 Test Station T(45-31)

_____ Leachate Tank 103A, 24" Riser Pipe

8.5 The following steps will verify proper operation of the anodes and will measure the accuracy of the ammeter and voltmeter mounted on Rectifier R-33 using the portable shunt.

_____ 8.5.1 Turn off the rectifier for the AP Tank Farm cathodic protection system (Rectifier No. R-2, reference drawing H-2-94079 and H-2-94085).

_____ 8.5.2 Verify circuit breaker No. 9, in Distribution Panel D-PB-01, is in OPEN position.

_____ 8.5.3 Verify that all COARSE and FINE output transformer taps on rectifier are set at the lowest levels (Coarse - A and Fine - 1).

_____ 8.5.4 Close circuit breaker No. 9 in Distribution Panel D-PB-01.

_____ 8.5.5 Close rectifier input circuit breaker and record volts and amps, and then open input circuit breaker. Set fine tap to next higher setting and leave coarse tap as previously set. Close input circuit breaker again and record volts and amps, then OPEN the input circuit breaker. Continue adjusting the output of the rectifier in steps until either the dc volts or dc amperes (whichever is first) approaches, but does not exceed, the nameplate rating of rectifier which is 12A dc or 60V dc.

Transformer Taps		dc Output	
Coarse	Fine	Volts	Amps
A	1	_____	_____
A	2	_____	_____
A	3	_____	_____
A	4	_____	_____
A	5	_____	_____

<u>Transformer Taps</u>		<u>dc Output</u>	
<u>Coarse</u>	<u>Fine</u>	<u>Volts</u>	<u>Amps</u>
B	1	—	—
B	2	—	—
B	3	—	—
B	4	—	—
B	5	—	—
C	1	—	—
C	2	—	—
C	3	—	—
C	4	—	—
C	5	—	—
D	1	—	—
D	2	—	—
D	3	—	—
D	4	—	—
D	5	—	—

8.5.6

At rectifier's maximum adjustment achieved in step 8.5.5, check the accuracy of ammeter and voltmeter mounted on the rectifier using a multicombo meter (maximum voltage and current deviation allowed $\pm 2\%$). Use the following formula:

$$\% \text{ Dev} = 100 \frac{(R_{MR} - M_R)}{(M_R)}$$

Where: % Dev = Percent deviation (positive quantity where rectifier meter reading is greater than multimeter, negative quantity where rectifier meter reading is less than multimeter).

R_{MR} = Rectifier meter reading (voltmeter or ammeter).

M_R = Multimeter reading.

a. Reading across rectifier shunt _____

b. Ammeter reading _____ % Deviation _____

- c. Voltage across (+) and (-) terminals _____
- d. Voltmeter reading _____ % Deviation _____
- _____ 8.5.7 OPEN the rectifier input circuit breaker.
- _____ 8.5.8 Disconnect the (+) anode header cable, from positive terminal of rectifier, leaving (+L) anode loop cable connected.
- _____ 8.5.9 Close the rectifier input circuit breaker and record the following.
 - _____ dc output amps on rectifier ammeter
 - _____ dc output volts on rectifier voltmeter
- _____ 8.5.10 Open the rectifier input circuit breaker and reconnect the (+) anode header cable disconnected in step 8.5.8.
- _____ 8.5.11 Connect the negative terminal of multicombo dc meter to the protected pipelines through a portable test reel at various convenient test stations for the following procedure.
- _____ 8.5.12 Connect a portable copper-copper sulfate reference electrode to the positive terminal of multicombo meter.
- _____ 8.5.12.1 Record the following reference electrode data:
 - _____ a. Manufacturer: _____
 - _____ b. Model and type: _____
- _____ 8.5.13 Close the rectifier input circuit breaker, place the portable reference electrode over each anode location and measure the pipe to soil potential. Record the pipe to portable reference electrode potential at each anode location. Values should not be less negative than (-)0.85V dc and not more negative than (-)1.5V dc. Adjustment of the rectifier will be necessary if the values are not within this range.

<u>Anode</u>	<u>Volts</u>
A (45-1)	_____
A (45-2)	_____
A (45-3)	_____
A (45-4)	_____
A (45-5)	_____

A (45-6)	_____
A (45-7)	_____
A (45-8)	_____
A (45-9)	_____
A (45-10)	_____
A (45-11)	_____
A (45-12)	_____
A (45-13)	_____
A (45-14)	_____
A (45-15)	_____
A (45-16)	_____
A (45-17)	_____
A (45-18)	_____
A (45-19)	_____
A (45-20)	_____
A (45-21)	_____
A (45-22)	_____
A (45-23)	_____
A (45-24)	_____
A (45-25)	_____
A (45-26)	_____
A (45-27)	_____
A (45-28)	_____
A (45-29)	_____
A (45-30)	_____
A (45-31)	_____

<u>Anode</u>	<u>Volts</u>
A (45-32)	_____
A (45-33)	_____
A (45-34)	_____

- 8.5.14 OPEN the rectifier input circuit breaker. Disconnect the (+L) anode loop cable from the rectifier positive terminal leaving the (+) anode header cable connected.
- 8.5.15 CLOSE the rectifier input circuit breaker and record the following.
 _____ dc output amps on rectifier ammeter
 _____ dc output volts

The dc output volts recorded here should be within ± 0.5 volts of that recorded in step 8.5.9.
- 8.5.16 OPEN the rectifier input circuit breaker and reconnect the anode loop cable (+L) disconnected in step 8.5.14.
- 8.5.17 Return the taps to the lowest setting (Coarse - A and Fine - 1).
- 8.5.18 Turn on the AP Tank Farm cathodic protection system that was temporarily shut OFF in step 8.5.1.
- 8.6 CLOSE the rectifier input circuit breaker 24 hours prior to this test. Measure and record the pipe to soil potential of each protected pipe by use of a multicombo meter connected to the reference electrode lead and to one of the pipe test conductors at each test station.

Values should not be less negative than (-)0.85V dc and not more negative than (-)1.5V dc.
- 8.6.1 Test Station T(45-1)
Reference Electrode RE(45-1) and Pipe 3"-H-C2-P01
Potential Reading _____
- 8.6.2 Test Station T(45-2)
Reference Electrode RE(45-2) and Pipe 8"-V-S6-P05
Potential Reading _____
- 8.6.3 Test Station T(45-3) Deleted

_____ 8.6.4

Test Station T(45-4)

Reference Electrode RE(45-4) and Pipe 8"-V-S6-P05
Potential Reading _____

_____ 8.6.5

Test Station T(45-5A)

Reference Electrode RE(45-5A) and Pipes Potential Reading:

_____ 1"-H-S2-P03

_____ 1"-A-C3-P19

_____ 2"-S1 (Spare)

_____ 2"-H-C2-P08

_____ 1"-F-S1-P03

_____ 2"-F-S1-P02

_____ 8.6.6

Test Station T(45-5B)

Reference Electrode RE(45-5C) and Pipes Potential Reading:

_____ 3"-H-C2-P01

_____ 2"-S1 (Spare)

_____ 2"-H-S5-P01

_____ 1"-F-S1-P14

_____ 2"-F-S1-P04

_____ C4 X 5.4 Channel

_____ 8.6.7

Test Station T(45-6)

Reference Electrode RE(45-6) and Pipe 1"-S-C8-P02
Potential Reading _____

_____ 8.6.8

Test Station T(45-7)

Reference Electrode RE(45-7) and Pipe 3"-H-C2-P01
Potential Reading _____

8.6.9

Test Station T(45-8)

a. Reference Electrode RE(45-8A) and Pipe 3"-H-C2-P01
Potential Reading _____

_____ b. Reference Electrode RE(45-8B) and Pipe 3"-H-C2-P01
Potential Reading _____

8.6.10 Test Station T(45-9)

_____ a. Reference Electrode RE(45-9) and Pipe 2"-G-001-M25
Potential Reading _____

_____ b. Reference Electrode RE(45-9) and Pipe 2"-W-C1-P01
Potential Reading _____

8.6.11 Test Station T(45-10)

_____ a. Reference Electrode RE(45-10A) and Pipe 2"-EW-002-M25
Potential Reading _____

_____ b. Reference Electrode RE(45-10A) and Pipe 3"-H-C2-P01
Potential Reading _____

_____ c. Reference Electrode RE(45-10A) and Pipe 2"-W-C1-P01
Potential Reading _____

_____ d. Reference Electrode RE(45-10B) and Pipe 2"-W-C1-P01
Potential Reading _____

_____ e. Reference Electrode RE(45-10B) and Pipe 3"-H-C2-P01
Potential Reading _____

_____ f. Reference Electrode RE(45-10B) and Pipe 2"-EW-002-M25
Potential Reading _____

8.6.12 Test Station T(45-11)

_____ a. Reference Electrode RE(45-11) and Pipe 2"-G-001-M25
Potential Reading _____

_____ b. Reference Electrode RE(45-11) and Pipe 2"-EW-002-M25
Potential Reading _____

8.6.13 Test Station T(45-12)

_____ a. Reference Electrode RE(45-12) and Pipe 2"-G-001-M25
Potential Reading _____

_____ b. Reference Electrode RE(45-12) and Pipe 3"-H-C2-P01
Potential Reading _____

8.6.14 Test Station T(45-13)

_____ a. Reference Electrode RE(45-13) and Pipe 2"-G-001-M25
Potential Reading _____

- _____ b. Reference Electrode RE(45-13) and Pipe 2"-EW-002-M25
Potential Reading _____
- 8.6.15 Test Station T(45-14)
- _____ a. Reference Electrode RE(45-14) and Pipe 2"-G-001-M25
Potential Reading _____
- 8.6.16 Test Station T(45-15)
- _____ b. Reference Electrode RE(45-15) and Pipe 2"-G-001-M25
Potential Reading _____
- 8.6.17 Test Station T(45-16)
- _____ a. Reference Electrode RE(45-16) and Pipe 2"-GR-200-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-16) and Pipe 2"-EW-201-M25
Potential Reading _____
- 8.6.18 Test Station T(45-17)
- _____ a. Reference Electrode RE(45-17) and Pipe 2"-GR-200-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-17) and Pipe 2"-EW-201-M25
Potential Reading _____
- 8.6.19 Test Station T(45-18)
- _____ a. Reference Electrode RE(45-18) and Pipe 2"-GR-200-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-18) and Pipe 2"-EW-201-M25
Potential Reading _____
- 8.6.20 Test Station T(45-19)
- _____ a. Reference Electrode RE(45-19) and Pipe 2"-GR-200-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-19) and Pipe 2"-EW-201-M25
Potential Reading _____
- 8.6.21 Test Station T(45-20)
- _____ a. Reference Electrode RE(45-20) and Pipe 2"-GR-200-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-20) and Pipe 2"-EW-201-M25
Potential Reading _____

8.6.22 Test Station T(45-21)

- _____ a. Reference Electrode RE(45-21) and Pipe 2"-GR-200-M25 Potential Reading _____
- _____ b. Reference Electrode RE(45-21) and Pipe 2"-EW-201-M25 Potential Reading _____

8.6.23 Test Station T(45-22)

- _____ a. Reference Electrode RE(45-22) and Pipe 2"-GR-200-M25 Potential Reading _____
- _____ b. Reference Electrode RE(45-22) and Pipe 2"-EW-201-M25 Potential Reading _____

8.6.24 Test Station T(45-23)

- _____ a. Reference Electrode RE(45-23) and Pipe 2"-GR-200-M25 Potential Reading _____
- _____ b. Reference Electrode RE(45-23) and Pipe 2"-EW-201-M25 Potential Reading _____

8.6.25 Test Station T(45-24)

- _____ a. Reference Electrode RE(45-24) and Leachate tank 101A, 18" Riser Pipe No. 1 Potential Reading _____
- _____ b. Reference Electrode RE(45-24) and Leachate Tank 101A, 18" Riser Pipe No. 2 Potential Reading _____
- _____ c. Reference Electrode RE(45-24) and Leachate Tank 101A, 4" Riser Pipe _____

8.6.26 Test Station T(45-25)

- _____ a. Reference Electrode RE(45-25) and Pipe 2"-GR-203-M25 Potential Reading _____
- _____ b. Reference Electrode RE(45-25) and Pipe 2"-EW-202-M25 Potential Reading _____

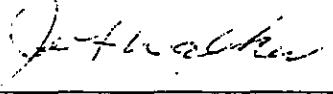
8.6.27 Test Station T(45-26)

- _____ a. Reference Electrode RE(45-26) and Pipe 2"-GR-203-M25 Potential Reading _____

- _____ b. Reference Electrode RE(45-26) and Pipe 2"-EW-202-M25
Potential Reading _____
- 8.6.28 Test Station T(45-27)
- _____ a. Reference Electrode RE(45-27) and Pipe 2"-GR-203-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-27) and Pipe 2"-EW-202-M25
Potential Reading _____
- 8.6.29 Test Station T(45-28)
- _____ a. Reference Electrode RE(45-28) and Pipe 2"-GR-203-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-28) and Pipe 2"-EW-202-M25
Potential Reading _____
- 8.6.30 Test Station T(45-29)
- _____ a. Reference Electrode RE(45-29) and Pipe 2"-GR-203-M25
Potential Reading _____
- _____ b. Reference Electrode RE(45-29) and Pipe 2"-EW-202-M25
Potential Reading _____
- 8.6.31 Test Station T(45-30)
- _____ a. Reference Electrode RE(45-30) and Leachate Tank 102A,
24" Riser Pipe.
Potential Reading _____
- 8.6.32 Test Station T(45-31)
- _____ a. Reference Electrode RE(45-31) and Leachate Tank 103A,
24" Riser Pipe.
Potential Reading _____
- 8.6.33 Open the rectifier input circuit breaker and open circuit breaker
No. 9 in Distribution Panelboard D-PB-01.

LAST PAGE OF PROCEDURE

EXCEPTION NO.		Project No.		ATP No.	Rev.
Recorded by		Organization		Date Recorded	ATP Page No.
Step No.	Requirement				
Description of Problem					
Objector 1 (Name/Organization)			Objector 2 (Name/Organization)		
Planned Action					
Action Taken					
RETEST EXECUTION AND ACCEPTANCE					
Retest Installation Contractor	Date	Recorder		Date	
Witness 1 (Name/Organization)	Date	Witness 2 (Name/Organization)		Date	
Field Engineering	Date	Test Director (Name/Organization)		Date	
Design Engineering (Author of ATP)	Date	A-E Project Engineer		Date	
APPROVAL AND ACCEPTANCE – OPERATING CONTRACTOR					
<input type="checkbox"/> Retest Approved and Accepted		<input type="checkbox"/> Exception Accepted-as-is*		<input type="checkbox"/> Other*	
Explanation					
Approver 1	Date	Approver 2		Date	
Approver 3	Date	Approver 4		Date	

Prepared By RJ Thomas	WESTINGHOUSE HANFORD COMPANY PO BOX 1970 RICHLAND, WASHINGTON 99352	Number HS-BS-0015
Department PLANT ENGINEERING		Type SPECIAL PROCESS
		Date October 5, 1987
Classified <input type="checkbox"/> Unclassified <input checked="" type="checkbox"/>	SPECIFICATION	Supersedes Spec HS-BS-0015 Rev B Dated 8/18/87
		Rev Ltr C Page 1 of 7 Total Pages
Title IDENTIFICATION METHODS		
Approvals R.J. Oliver PLANT ENGINEERING	 J.A. LAUK 10-5-87	 J. FRANKLIN RADIOLOGICAL PROTECTION
List Of Revisions - Section 3.4 Added: Type C - Felt tip marking pen.		

Number	REVISION LETTER				Date	Page
			C			
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IDENTIFICATION METHODS

1.0 SCOPE - This specification provides for the permanent and temporary identification methods applicable to manufactured or procured parts, subassemblies, and assemblies.

2.0 APPLICABLE DOCUMENTS - The following documents of the exact issue shown, form a part of this specification to the extent specified herein. In the event of a conflict between the documents referenced herein, and the contents of this specification, the author should be notified.

MIL - STD 889B Dissimilar Metals

GOVERNMENT STANDARDS

OSHA 2206 Occupational Safety and Health Administration, General Industry Standards, Chapter XVII, Section 1910.96, IONIZING RADIATION, dated March 1983

INDUSTRY

ANSI A13.1 - 1981 Scheme for the Identification of Piping Systems

HANFORD PLANT STANDARDS

HPS I-2-7, Rev 3 Equipment Nameplates

3.0 REQUIREMENTS

3.1 Cleanliness - Surfaces to be marked shall be visibly free of oil, grease, dirt, corrosion, or any other material that would adversely affect their application or adhesion of the marking.

3.2 Legibility - All markings shall be clearly legible. Color markings, including black and white, shall contrast with the color of the surface to which it is applied. Freehand lettering for the purpose of temporary marking shall be in the printed form.

3.3 Permanent Identification Methods

Type 1 Vibratory marking

Type 2 Die-stamping

Type 3 Raised marking forged or cast into the surface

Type 4 Recessed marking forged or cast into the surface

Type 5 Electrochemical etch

Type 6 Nameplate

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Type 8 Painting

Type 9 Packaging

Type 10 Tagging

3.3.1 Vibratory Marking - Vibrating tools shall be fitted with a carbide marking point, or equivalent, and shall be adjusted to a shallow rounded impression 0.003 to 0.010 inch in depth. The marking tool tip minimum radius shall be 0.005 inch. The size (height) of characters produced by vibratory marking shall be selected within the range of 1/16 to 1/2 inch.

3.3.2 Die Stamping - Die stamps shall be low-stress type stamps. The minimum tip radius of the dies shall be as specified for the following character sizes:

Character Size <u>(Inch)</u>	Minimum Tip Radius <u>(Inch)</u>
1/16	0.005
3/32	0.006
1/8	0.007
3/16	0.008
1/4	0.010
3/8	0.012
1/2	0.014

- a) Impression depth shall not exceed 0.10 inch.
- b) Die stamp marking shall be applied to a flange, an integrally cast or forged boss or pad, the base or support of the item, or other visible low stress location.
- c) The material thickness of an item to be marked shall not be reduced by die stamping to less than the minimum specified on the drawing or specification.

3.3.3 Integral Markings - Raised or recessed identification markings that are cast or gorged integrally with the item are acceptable. Recessed markings shall not reduce the material thickness of an item to less than the minimum specified on the drawing or specification. The size of forged or cast characters called out on the drawing/specification shall only be limited by the space available, but in no case be less than 0.09 inch in height.

3.3.4 Electrochemical Etching - The electrolyte and neutralizer used for electrochemical etching shall be compatible with the material to be marked. The depth of etching shall be no greater than 0.5 percent of the material thickness or 0.003 inch, whichever is less. The size of characters produced by electrochemical etching shall be selected within the range of 1/16 to 1/2 inch, however, recommended minimum size is 0.1 inch to accommodate typing applications.

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3.3.5 Nameplates - The physical requirements, (e.g., material, nameplate dimensions, character size and arrangement) for metal nameplates shall be either detailed on the applicable drawing or specification or defined by reference to an applicable nameplate standard; specification or drawing. Plastic nameplates shall be specified on the item drawing or specification in accordance with HPS-I-2-7, including nameplate size, size of characters, and method of attachment. Metal nameplates, when attached by welding, shall be welded in accordance with the welding requirements applicable to the item. The attachment method and location of the item of either type of nameplate shall be established on the basis of stress imposed on the item and shall take into consideration the possibility of crevice corrosion between the nameplate and the surface of the item.

3.3.6 Self-Adhesive Labels - Self-adhesive labels may be used for identification providing they meet the requirements specified in 3.5. When used to mark components in systems such as piping or electrical systems or used as regulatory marking, self-adhesive labels shall conform to applicable government, society, or industry standards or codes, for example:

- a) When marking a piping system, a recognized standard ANSI A13.1, shall be invoked on the applicable drawing/specification along with this specification.
- b) If labels are used to identify system or component radiation hazards, a standard such as OSHA 2206 Section 1910.96, shall be specified on the applicable drawing/specification along with this specification.

3.3.7 Painting - Paints suitable for the purpose and/or as specified shall be used to apply stenciled markings to items (see 3.2 and 3.5). Stenciled markings may be applied using a template or silkscreen. The size of the stenciled characters specified on the drawing/specification shall be selected within the range of 1/3 to 3 inches. The color and type of paint to be used shall also be specified on the drawing/specification. Crafted (freehand sign painted) application of marking in lieu of stenciling, is acceptable with due consideration being given to the higher cost involved.

NOTE: For the purpose of marking items within Westinghouse, the following stencil sizes are available: 1/2, 3/4, 1, 1-1/2, 2, and 3 inches.

3.3.8 Packaging - Identical items too small to be identified individually may be packaged in a box or bag marked with the item identification.

3.3.9 Tagging - Items not suited for other methods of identification may be tagged. Tags and attaching materials shall be compatible with the item material to the extent specified in 3.5 (a) and 3.5 (b).

3.4 Temporary Identification Methods - Temporary markings may be applied by a number of materials and methods as defined below:

Type A - Rubber stamp and ink

Type B - Rubber roller or wheel and ink

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Type C - Felt tip marking pen

Type D - Removable self-adhesive label or tape

Type E - Label attached with removable tape

Type F - Removable tag

Type G - Packaging

Type H - Scribing tool

Type J - Paint stick

3.4.1 Inks - Inks used for all type of temporary marking, including felt tipped pens, rubber stamps, rubber roller, and rubber wheel shall meet the requirements of Paragraph 3.5 (b).

3.4.2 Self-Adhesive Labels and Tape - The adhesives of self-adhesive labels and tape used for temporary marking shall meet the requirements of Paragraph 3.5.

3.4.3 Tagging - Materials used for temporary identification tagging shall be selected on the same basis as for permanent identification tagging (see 3.3.9).

3.4.4 Packaging - Packaging requirements for temporary identification shall be the same as for permanent identification (see 3.3.8).

3.4.5 Scribing Tool - Scribing tools may be used for temporary identification during fabrication or construction, providing such marking is not applied to critical surfaces such as finished, machined, or sealing surfaces.

3.4.6 Removal of Temporary Marking - All temporary marking shall be removed from stainless steel and corrosion resistant material surfaces prior to fabrication operations, which render markings inaccessible, prior to final heat treatment, and prior to post-manufacturing acceptance or post-installation acceptance, as appropriate. Ink markings and residue from tapes shall be removed using new or re-distilled alcohol or acetone. The removal of temporary markings shall assure cleanliness of the material and be in accordance with applicable cleanliness acceptance criteria.

3.5 Material Compatibility - Materials used for permanent or temporary marking or for the removal of markings shall be physically and chemically compatible with the material to which the markings will be applied or removed. The following shall be avoided:

- a) The use of dissimilar metals in permanent contact as defined in MIL-STD-889B.
- b) The use on corrosion resistant, stainless steel, and some nickel base alloys of materials containing more than:

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- 1) one-half percent by weight of halides (chlorides and fluorides),
 - 2) one-half percent by weight of sulfur, and
 - 3) a sum total of one-half percent by weight of low melting point elements such as cadmium, aluminum, lead, zinc, and mercury.
- c) Permanent marking of critical stainless steel components using labels, tape, paint, or other marking materials that could cause crevice corrosion.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Visual Inspection - Item surfaces and marking shall be visually inspected to determine conformance with the applicable requirements specified in 3.1 and 3.2.

4.2 Certification of Conformance - Materials used for the application and removal of marking on corrosion resistant, stainless steel, and some nickel base alloys shall be free of halides and low melting point elements to the extent specified in 3.5 (b). Written certification by the manufacturer that his product does not exceed the halide and elemental content specified in 3.5 (b) is acceptable and will preclude the necessity for acceptance testing that product.

4.3 Certification of Process Used for Permanent Marking - Tools used to apply permanent marking and the resultant mark shall meet the applicable requirements specified in 3.3. To preclude repeated examination of production marking, except as specified in 4.1, tools and sample markings made by the tools shall be examined to determine conformance with applicable requirements. Upon successfully passing an examination, the process shall be certified acceptable for production use.

5.0 PREPARATION FOR DELIVERY

This section not applicable to this specification.

6.0 NOTES

6.1 Typical Callout - Typical callouts for invoking this specification are as follows:

- o Mark per HS-BS-0015, Type 2, 1/8 inch characters in location indicated.

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- o Identify per HS-BS-0015, Type 8, with drawing number, part number, and drawing revision number in location indicated using 1-1/2 high characters. Paint shall be per Note "X", black background with yellow characters.

6.2 Acceptable Sources for Ink - One company known to manufacture ink and marking pens filled with ink which meets the chemical requirements specified in 3.5 (b), is as follows:

Organic Products Co. (OPCO)
 P.O. Box 428
 Irving, Texas 75060

Products: OPCP Marker with F-100 Black Ink*

*For use at Hanford, these materials are available in Westinghouse Stores, with the following catalog number and description:

53-5300-200 Marking Pen, OPCO F-100

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PRELIMINARY CPM SCHEDULE

for

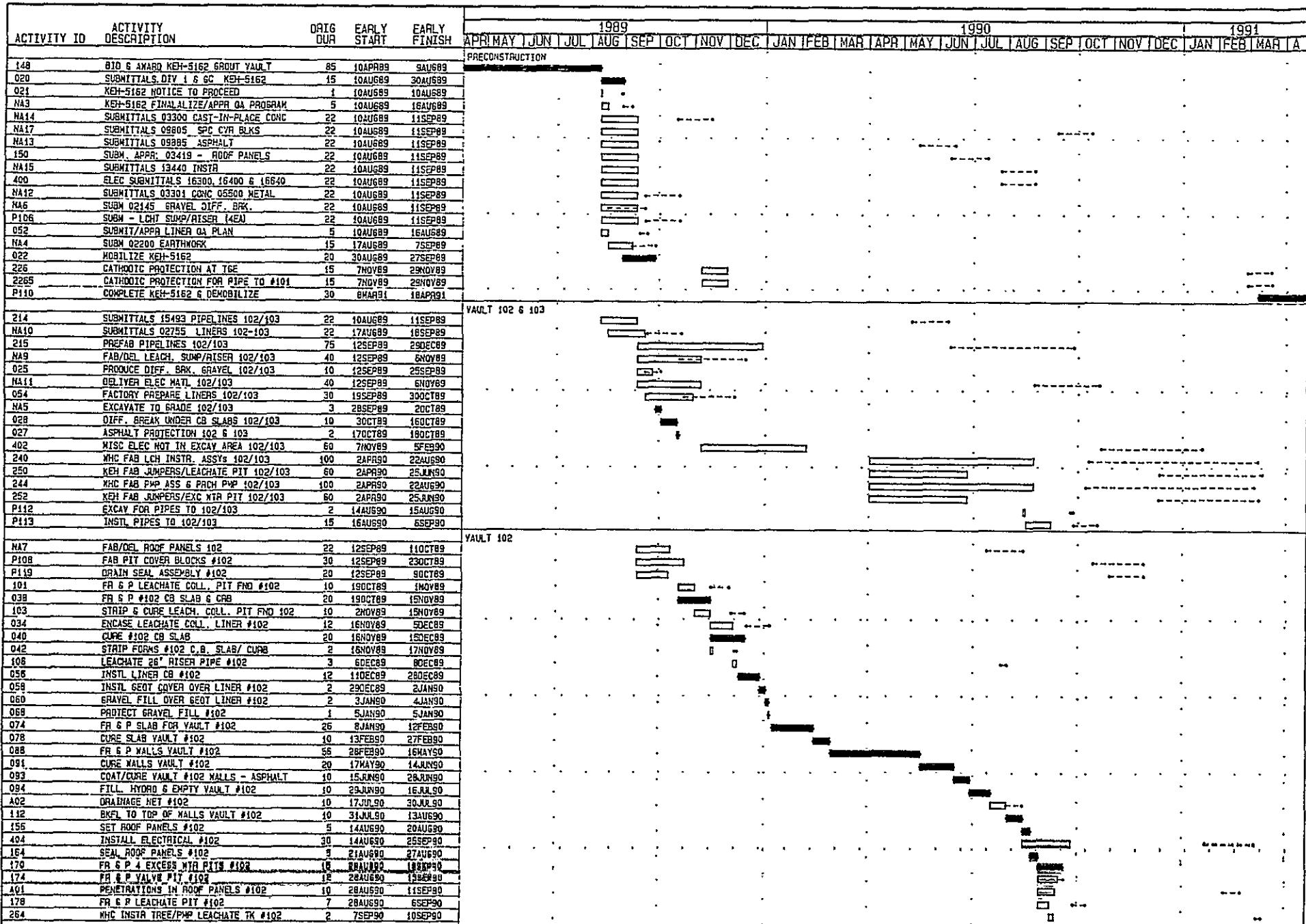
CONSTRUCTION of VAULTS 102 THROUGH 105

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1988				1989				1990				1991											
OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
01 DESIGN																							
02 ENGINEERING & INSPECTION																							
1A KFH-5111 MASS EXCAVATION																1B 1 CF GROUND MONITORING WELLS							
3A KFH-5162 GROUT VAULT																3B CF GROUT VAULT TIE-INS							
WNC WHC OPERATIONS & PROJ MGMT																4A FP CL SR CVR/ROADS 102/103							
																4B FP CL SR CVR/ROADS 104/105							

<input checked="" type="checkbox"/> Directive <input type="checkbox"/> Summary Bar/ Early Dates <input checked="" type="checkbox"/> Critical Designator <input checked="" type="checkbox"/> Progress Bar	KAISER ENGINEERS HANFORD GROUT VAULT PAIRS 102/103 & 104/105 B-714 / ER9088 Start : 1JAN88 Project Finish: 27SEP91 <i>G. Danner</i>	Sheet 1 of 1 Date Date: 4JAN88 Plot Date: 13APR89	PROJECT SCHEDULE JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
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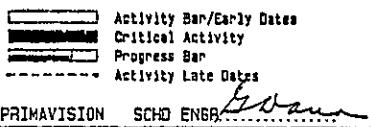
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Start : 1JAN88
Project Finish: 27SEP91

KAISER ENGINEERS HANFORD
GROUT VAULT

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GROUT VAULT PAIRS 102/103 & 104/105
 PROJECT SCHEDULE

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL	
			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
ee	ee	ee	ee	ee	ee	ee	ee	ee	ee	ee	ee

*****	001	4.0.0 WHC PROJECT MANAGEMENT			*	700	*	03Oct88	18Jul91	03Oct88	18Jul91	*	0
*****	005	DESIGN VAULTS	102/103		*	250		E04Jan88	L29Dec88	05Jan88	30Dec88	*	1
S	FS	0055	DESIGN VAULTS	104/105		80		E03Apr89	L26Jul89	06Apr89	31Jul89		3
P	FS	005	DESIGN VAULTS	102/103	*	250		E04Jan88	L29Dec88	05Jan88	30Dec88		1
*****	0055	DESIGN VAULTS	104/105		*	80		E03Apr89	L26Jul89	06Apr89	31Jul89	*	3
S	FS	P104	ISSUE DWGS FOR	104/105 DESIGN		1		27Jul89	27Jul89	22Nov89	22Nov89		83
P	FS	0965	FILL, HYDRO & EMPTY VAULT	#105	*	10		04Oct90	L17Oct90	04Oct90	17Oct90		0
*****	006	CF GROUND MONITORING WELL			*	10		18Oct90	31Oct90	18Oct90	31Oct90	*	0
S	FS	1605	SET ROOF PANELS	#105		5		01Nov90	07Nov90	01Nov90	07Nov90		0
S	FS	P1125	EXCAV FOR PIPES TO	104/105		2		01Nov90	02Nov90	14Dec90	17Dec90		29
*****	007	ENGINEERING & INSPECTION			*	650	*	E01Dec88	03Jul91	01Dec88	03Jul91	*	0
*****	008	START PROJECT CONSTRUCTION			*			E01Oct88	01Oct88	03Oct88	03Oct88	*	2
S	FS	001	4.0.0 WHC PROJECT MANAGEMENT			700		03Oct88	18Jul91	03Oct88	18Jul91		0
S	FS	010	BID & AWARD CP #1A MASS EXCAV			30		03Oct88	11Nov88	04Oct88	14Nov88		1
S	FS	148	BID & AWARD KEH-5162 GROUT VAULT			85		E10Apr89	09Aug89	10Apr89	09Aug89		0
S	FS	282	WHC FURN NOZZLES,PLATES & CONN	102/103		40		E01Jun89	28Jul89	13Apr90	08Jun90		217
S	FS	2825	WHC FURN NOZZLES,PLATES & CONN	104/105		40		E01Jun89	28Jul89	05Jul90	29Aug90		273
S	FS	283	WHC TIE-IN 15KV OVERHEAD LINES			1		06Feb90	06Feb90	21Jan91	21Jan91		239
P	FS	008	START PROJECT CONSTRUCTION					01Oct88	L01Oct88	03Oct88	03Oct88		2
*****	010	BID & AWARD CP #1A MASS EXCAV			*	30		03Oct88	11Nov88	04Oct88	14Nov88	*	1
S	FS	012	MAKE & PROCESS SUBM (MASS EXCAV)			5		14Nov88	18Nov88	15Nov88	21Nov88		1
P	FS	010	BID & AWARD CP #1A MASS EXCAV			30		03Oct88	L11Nov88	04Oct88	14Nov88		1
*****	012	MAKE & PROCESS SUBM (MASS EXCAV)			*	5		14Nov88	18Nov88	15Nov88	21Nov88	*	1
S	FS	014	MOBILIZE KEH-5111 MASS EXC			5		21Nov88	29Nov88	22Nov88	30Nov88		1
P	FS	012	MAKE & PROCESS SUBM (MASS EXCAV)			5		14Nov88	L18Nov88	15Nov88	21Nov88		1
*****	014	MOBILIZE KEH-5111 MASS EXC			*	5		21Nov88	29Nov88	22Nov88	30Nov88	*	1
S	FS	016	MASS EXCAVATE (4 VAULTS)			41		30Nov88	30Jan89	01Dec88	31Jan89		1
P	FS	014	MOBILIZE KEH-5111 MASS EXC			5		21Nov88	L29Nov88	22Nov88	30Nov88		1
*****	016	MASS EXCAVATE (4 VAULTS)			*	41		30Nov88	30Jan89	01Dec88	31Jan89	*	1
S	FS	018	COMPLETE KEH-5111					31Jan89	L31Jan89	01Feb89	01Feb89		1
P	FS	016	MASS EXCAVATE (4 VAULTS)			41		30Nov88	L30Jan89	01Dec88	31Jan89		1
*****	018	COMPLETE KEH-5111			*			31Jan89	L31Jan89	01Feb89	01Feb89	*	1

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CT REL LAG	ACTIVITY NUMBER	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT

P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	020	SUBMITTALS, DIV 1 & GC KEH-5162	*	15	* 10Aug89	30Aug89	10Aug89	30Aug89 *	0
S SS	14	022 MOBILIZE KEH-5162		20	30Aug89	27Sep89	30Aug89	27Sep89	0
S FS	0265	EXCAVATE TO GRADE 104/105		5	28Sep89	04Oct89	15Dec89	21Dec89	54
S FS	NA5	EXCAVATE TO GRADE 102/103		3	28Sep89	02Oct89	28Sep89	02Oct89	0
P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	021	KEH-5162 NOTICE TO PROCEED	*	1	* 10Aug89	10Aug89	29Aug89	29Aug89 *	13
S FS	022	MOBILIZE KEH-5162		20	30Aug89	27Sep89	30Aug89	27Sep89	0
P SS	14	020 SUBMITTALS, DIV 1 & GC KEH-5162	15	10Aug89	L30Aug89	10Aug89	30Aug89	0	
P FS	021	KEH-5162 NOTICE TO PROCEED		1	10Aug89	10Aug89	29Aug89	29Aug89	13
*****	022	MOBILIZE KEH-5162	*	20	* 30Aug89	27Sep89	30Aug89	27Sep89 *	0
S FS	0265	EXCAVATE TO GRADE 104/105		5	28Sep89	04Oct89	15Dec89	21Dec89	54
S FS	NA5	EXCAVATE TO GRADE 102/103		3	28Sep89	02Oct89	28Sep89	02Oct89	0
P FS	NA6	SUBM 02145 GRAVEL DIFF. BRK.	22	10Aug89	L11Sep89	17Aug89	18Sep89	5	
*****	025	PRODUCE DIFF. BRK. GRAVEL 102/103	*	10	* 12Sep89	25Sep89	19Sep89	02Oct89 *	5
S FS	028	DIFF. BREAK UNDER CB SLABS 102/103		10	030Oct89	160ct89	030ct89	160ct89	0
P FS	NA6	SUBM 02145 GRAVEL DIFF. BRK.	22	10Aug89	L11Sep89	17Aug89	18Sep89	5	
*****	0255	PRODUCE DIFF. BRK. GRAVEL 104/105	*	10	* 12Sep89	25Sep89	08Dec89	21Dec89 *	61
S FS	0285	DIFF. BREAK UNDER CB SLABS 104/105		10	050Oct89	180ct89	22Dec89	09Jan90	54
P FS	020	SUBMITTALS, DIV 1 & GC KEH-5162	15	10Aug89	L30Aug89	10Aug89	30Aug89	0	
P FS	022	MOBILIZE KEH-5162		20	30Aug89	27Sep89	30Aug89	27Sep89	0
*****	0265	EXCAVATE TO GRADE 104/105	*	5	* 28Sep89	04Oct89	15Dec89	21Dec89 *	54
S FS	0285	DIFF. BREAK UNDER CB SLABS 104/105		10	050Oct89	180ct89	22Dec89	09Jan90	54
P FS	028	DIFF. BREAK UNDER CB SLABS 102/103	10	030ct89	L160ct89	030ct89	16Oct89	0	
*****	027	ASPHALT PROTECTION 102 & 103	*	2	* 170ct89	180ct89	170ct89	180ct89 *	0
S FF	0	0275 ASPHALT PROTECTION 104 & 105		2	190ct89	200ct89	10Jan90	11Jan90	54
S FS	038	FR & P #102 CB SLAB & CRB		20	190ct89	15Nov89	190ct89	15Nov89	0
S FS	044	FR & P #103 CB SLAB & CRB		20	190ct89	15Nov89	190ct89	15Nov89	0
S FS	101	FR & P LEACHATE COLL. PIT FND #102		10	190ct89	01Nov89	16Nov89	01Dec89	20
S FS	102	FR & P LEACHATE COLL. PIT FND #103		10	190ct89	01Nov89	16Nov89	01Dec89	20

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			TOTAL	START	FINISH	START	FINISH	FLOAT

P	FF	0	027	ASPHALT PROTECTION 102 & 103	2	17Oct89	L18Oct89	17Oct89	18Oct89	0
P	FS		0285	DIFF. BREAK UNDER CB SLABS 104/105	10	05Oct89	18Oct89	22Dec89	09Jan90	54
*****	*****		0275	ASPHALT PROTECTION 104 & 105	*	19Oct89	20Oct89	10Jan90	11Jan90	*
S	FS		0385	FR & P #104 CB SLAB & CRB	20	14Nov89	13Dec89	12Jan90	08Feb90	38
S	FS		0445	FR & P #105 CB SLAB & CRB	20	14Nov89	13Dec89	26Jan90	23Feb90	48
S	FS		1015	FR & P LEACHATE COLL. PIT FND #104	10	14Nov89	29Nov89	09Feb90	23Feb90	58
S	FS		1025	FR & P LEACHATE COLL. PIT FND #105	10	14Nov89	29Nov89	26Feb90	09Mar90	68
P	FS		025	PRODUCE DIFF. BRK. GRAVEL 102/103	10	12Sep89	L25Sep89	19Sep89	02Oct89	5
P	FS		NA5	EXCAVATE TO GRADE 102/103	3	28Sep89	02Oct89	28Sep89	02Oct89	0
*****	*****		028	DIFF. BREAK UNDER CB SLABS 102/103	*	03Oct89	16Oct89	03Oct89	16Oct89	*
S	FS		027	ASPHALT PROTECTION 102 & 103	2	17Oct89	18Oct89	17Oct89	18Oct89	0
P	FS		0255	PRODUCE DIFF. BRK. GRAVEL 104/105	10	12Sep89	L25Sep89	08Dec89	21Dec89	61
P	FS		0265	EXCAVATE TO GRADE 104/105	5	28Sep89	04Oct89	15Dec89	21Dec89	54
*****	*****		0285	DIFF. BREAK UNDER CB SLABS 104/105	*	05Oct89	18Oct89	22Dec89	09Jan90	*
S	FS		0275	ASPHALT PROTECTION 104 & 105	2	19Oct89	20Oct89	10Jan90	11Jan90	54
P	FS		103	STRIP & CURE LEACH. COLL. PIT FND 102	10	02Nov89	L15Nov89	04Dec89	15Dec89	20
P	FS		NA9	FAB/DEL LEACH. SUMP/RISER 102/103	40	12Sep89	06Nov89	19Oct89	15Dec89	27
*****	*****		034	ENCASE LEACHATE COLL. LINER #102	*	16Nov89	05Dec89	18Dec89	05Jan90	*
S	FS		074	FR & P SLAB FOR VAULT #102	26	08Jan90	12Feb90	08Jan90	12Feb90	0
S	FS		106	LEACHATE 26" RISER PIPE #102	3	06Dec89	08Dec89	26Jul90	30Jul90	159
P	FS		1035	STRIP & CURE LEACH. COLL. PIT FND 104	10	30Nov89	L13Dec89	26Feb90	09Mar90	58
P	FS		NA95	FAB/DEL LEACH. SUMP/RISER 104/105	40	14Nov89	15Jan90	12Jan90	09Mar90	38
*****	*****		0345	ENCASE LEACHATE COLL. LINER #104	*	16Jan90	31Jan90	12Mar90	27Mar90	*
S	FS		0745	FR & P SLAB FOR VAULT #104	26	13Feb90	21Mar90	28Mar90	02May90	30
S	FS		1065	LEACHATE 26" RISER PIPE #104	3	01Feb90	05Feb90	15Oct90	17Oct90	177
P	FS		104	STRIP & CURE LEACH. COLL. PIT FND 103	10	02Nov89	L15Nov89	04Dec89	15Dec89	20
P	FS		NA9	FAB/DEL LEACH. SUMP/RISER 102/103	40	12Sep89	06Nov89	19Oct89	15Dec89	27
*****	*****		036	ENCASE LEACHATE COLL. LINER #103	*	16Nov89	05Dec89	18Dec89	05Jan90	*
S	FS		076	FR & P SLAB FOR VAULT #103	26	08Jan90	12Feb90	08Jan90	12Feb90	0
S	FS		108	LEACHATE 26" RISER PIPE #103	3	06Dec89	08Dec89	01Oct90	03Oct90	205
P	FS		1045	STRIP & CURE LEACH. COLL. PIT FND 105	10	30Nov89	L13Dec89	12Mar90	23Mar90	68
P	FS		NA95	FAB/DEL LEACH. SUMP/RISER 104/105	40	14Nov89	15Jan90	12Jan90	09Mar90	38
*****	*****		0365	ENCASE LEACHATE COLL. LINER #105	*	16Jan90	31Jan90	26Mar90	10Apr90	*
S	FS		0765	FR & P SLAB FOR VAULT #105	26	13Feb90	21Mar90	11Apr90	16May90	40
S	FS		1085	LEACHATE 26" RISER PIPE #105	3	01Feb90	05Feb90	15Oct90	17Oct90	177

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P FS	027	ASPHALT PROTECTION 102 & 103	2	17Oct89	L18Oct89	17Oct89	18Oct89	0
P FS	NA12	SUBMITTALS 03301 CONC 05500 METAL	22	10Aug89	11Sep89	19Sep89	18Oct89	27
*****	038	FR & P #102 CB SLAB & CRB	*	19Oct89	15Nov89	19Oct89	15Nov89	*
S FS	040	CURE #102 CB SLAB	20	16Nov89	15Dec89	16Nov89	15Dec89	0
S FS	042	STRIP FORMS #102 C.B. SLAB/ CURB	2	16Nov89	17Nov89	07Dec89	08Dec89	13
P FS	0275	ASPHALT PROTECTION 104 & 105	2	19Oct89	L20Oct89	10Jan90	11Jan90	54
P FS	S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	13Nov89	28Nov89	11Jan90	38
*****	0385	FR & P #104 CB SLAB & CRB	*	14Nov89	13Dec89	12Jan90	08Feb90	*
S FS	0405	CURE #104 CB SLAB	20	14Dec89	15Jan90	09Feb90	09Mar90	38
S FS	0425	STRIP FORMS #104 C.B. SLAB/ CURB	2	14Dec89	15Dec89	26Feb90	27Feb90	48
P FS	038	FR & P #102 CB SLAB & CRB	20	19Oct89	L15Nov89	19Oct89	15Nov89	0
*****	040	CURE #102 CB SLAB	*	16Nov89	15Dec89	16Nov89	15Dec89	*
S FF	7 056	INSTL LINER CB #102	12	11Dec89	28Dec89	11Dec89	28Dec89	0
S SS	7 056	INSTL LINER CB #102	12	11Dec89	28Dec89	11Dec89	28Dec89	0
P FS	0385	FR & P #104 CB SLAB & CRB	20	14Nov89	L13Dec89	12Jan90	08Feb90	38
*****	0405	CURE #104 CB SLAB	*	14Dec89	15Jan90	09Feb90	09Mar90	*
S FF	7 0565	INSTL LINER CB #104	15	04Jan90	24Jan90	28Feb90	20Mar90	38
S SS	7 0565	INSTL LINER CB #104	15	04Jan90	24Jan90	28Feb90	20Mar90	38
P FS	038	FR & P #102 CB SLAB & CRB	20	19Oct89	L15Nov89	19Oct89	15Nov89	0
*****	042	STRIP FORMS #102 C.B. SLAB/ CURB	*	16Nov89	17Nov89	07Dec89	08Dec89	*
S FS	056	INSTL LINER CB #102	12	11Dec89	28Dec89	11Dec89	28Dec89	0
P FS	0385	FR & P #104 CB SLAB & CRB	20	14Nov89	L13Dec89	12Jan90	08Feb90	38
*****	0425	STRIP FORMS #104 C.B. SLAB/ CURB	*	14Dec89	15Dec89	26Feb90	27Feb90	*
S FS	0565	INSTL LINER CB #104	15	04Jan90	24Jan90	28Feb90	20Mar90	38
P FS	027	ASPHALT PROTECTION 102 & 103	2	17Oct89	L18Oct89	17Oct89	18Oct89	0
P FS	NA12	SUBMITTALS 03301 CONC 05500 METAL	22	10Aug89	11Sep89	19Sep89	18Oct89	27
*****	044	FR & P #103 CB SLAB & CRB	*	19Oct89	15Nov89	19Oct89	15Nov89	*
S FS	046	CURE #103 CB SLAB	20	16Nov89	15Dec89	16Nov89	15Dec89	0
S FS	048	STRIP FORMS #103 C.B. SLAB/ CURB	2	16Nov89	17Nov89	04Dec89	05Dec89	10
P FS	0275	ASPHALT PROTECTION 104 & 105	2	19Oct89	L20Oct89	10Jan90	11Jan90	54
P FS	S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	13Nov89	28Nov89	11Jan90	38
*****	0445	FR & P #105 CB SLAB & CRB	*	14Nov89	13Dec89	26Jan90	23Feb90	*
S FS	0465	CURE #105 CB SLAB	20	14Dec89	15Jan90	26Feb90	23Mar90	48
S FS	0485	STRIP FORMS #105 C.B. SLAB/ CURB	2	14Dec89	15Dec89	12Mar90	13Mar90	58

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			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		044	FR & P #103 CB SLAB & CRB	20		19Oct89	L15Nov89	19Oct89	15Nov89	0	
*****	*****		046	CURE #103 CB SLAB	*	20	*	16Nov89	15Dec89	16Nov89	15Dec89 *	0
S	SS	7	062	INSTL LINER CB #103	15		06Dec89	28Dec89	06Dec89	28Dec89	0	
S	FF	7	062	INSTL LINER CB #103	15		06Dec89	28Dec89	06Dec89	28Dec89	0	

P	FS		0445	FR & P #105 CB SLAB & CRB	20		14Nov89	L13Dec89	26Jan90	23Feb90	48	
*****	*****		0465	CURE #105 CB SLAB	*	20	*	14Dec89	15Jan90	26Feb90	23Mar90 *	48
S	SS	7	0625	INSTL LINER CB #105	15		04Jan90	24Jan90	14Mar90	03Apr90	48	
S	FF	7	0625	INSTL LINER CB #105	15		04Jan90	24Jan90	14Mar90	03Apr90	48	

P	FS		044	FR & P #103 CB SLAB & CRB	20		19Oct89	L15Nov89	19Oct89	15Nov89	0	
*****	*****		048	STRIP FORMS #103 C.B. SLAB/ CURB	*	2	*	16Nov89	17Nov89	04Dec89	05Dec89 *	10
S	FS		062	INSTL LINER CB #103	15		06Dec89	28Dec89	06Dec89	28Dec89	0	

P	FS		0445	FR & P #105 CB SLAB & CRB	20		14Nov89	L13Dec89	26Jan90	23Feb90	48	
*****	*****		0485	STRIP FORMS #105 C.B. SLAB/ CURB	*	2	*	14Dec89	15Dec89	12Mar90	13Mar90 *	58
S	FS		0625	INSTL LINER CB #105	15		04Jan90	24Jan90	14Mar90	03Apr90	48	

P	FS		148	BID & AWARD KEH-5162 GROUT VAULT	85		10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	*****		052	SUBMIT/APPR LINER QA PLAN	*	5	*	10Aug89	16Aug89	14Sep89	20Sep89 *	24
S	FS		NA10	SUBMITTALS 02755 LINERS 102-103	22		17Aug89	18Sep89	21Sep89	20Oct89	24	

P	FS		NA10	SUBMITTALS 02755 LINERS 102-103	22		17Aug89	L18Sep89	21Sep89	20Oct89	24	
*****	*****		054	FACTORY PREPARE LINERS 102/103	*	30	*	19Sep89	30Oct89	23Oct89	05Dec89 *	24
S	FS		056	INSTL LINER CB #102	12		11Dec89	28Dec89	11Dec89	28Dec89	0	
S	FS		062	INSTL LINER CB #103	15		06Dec89	28Dec89	06Dec89	28Dec89	0	

P	FS		S100	SUBMITTALS FOR VAULTS 104-105	30		03Oct89	L13Nov89	28Nov89	11Jan90	38	
*****	*****		055	FACTORY PREPARE LINERS 104/105	*	30	*	14Nov89	29Dec89	16Jan90	27Feb90 *	40
S	FS		0565	INSTL LINER CB #104	15		04Jan90	24Jan90	28Feb90	20Mar90	38	
S	FS		0625	INSTL LINER CB #105	15		04Jan90	24Jan90	14Mar90	03Apr90	48	

P	FF	7	040	CURE #102 CB SLAB	20		16Nov89	L15Dec89	16Nov89	15Dec89	0	
P	SS	7	040	CURE #102 CB SLAB	20		16Nov89	15Dec89	16Nov89	15Dec89	0	
P	FS		042	STRIP FORMS #102 C.B. SLAB/ CURB	2		16Nov89	17Nov89	07Dec89	08Dec89	13	
P	FS		054	FACTORY PREPARE LINERS 102/103	30		19Sep89	30Oct89	23Oct89	05Dec89	24	
*****	*****		056	INSTL LINER CB #102	*	12	*	11Dec89	28Dec89	11Dec89	28Dec89 *	0
S	FS		058	INSTL GEOT COVER OVER LINER #102	2		29Dec89	02Jan90	29Dec89	02Jan90	0	

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			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FF	7	0405	CURE #104 CB SLAB	20		14Dec89	L15Jan90	09Feb90	09Mar90	38	
P	SS	7	0405	CURE #104 CB SLAB	20		14Dec89	15Jan90	09Feb90	09Mar90	38	
P	FS		0425	STRIP FORMS #104 C.B. SLAB/ CURB	2		14Dec89	15Dec89	26Feb90	27Feb90	48	
P	FS		055	FACTORY PREPARE LINERS 104/105	30		14Nov89	29Dec89	16Jan90	27Feb90	40	
*****	*****		0565	INSTL LINER CB #104	*	15	*	04Jan90	24Jan90	28Feb90	20Mar90 *	38
S	FS		0585	INSTL GEOT COVER OVER LINER #104	2		25Jan90	26Jan90	21Mar90	22Mar90	38	
P	FS		056	INSTL LINER CB #102	12		11Dec89	L28Dec89	11Dec89	28Dec89	0	
*****	*****		058	INSTL GEOT COVER OVER LINER #102	*	2	*	29Dec89	02Jan90	29Dec89	02Jan90 *	0
S	FS		060	GRAVEL FILL OVER GEOT LINER #102	2		03Jan90	04Jan90	03Jan90	04Jan90	0	
P	FS		0565	INSTL LINER CB #104	15		04Jan90	L24Jan90	28Feb90	20Mar90	38	
*****	*****		0585	INSTL GEOT COVER OVER LINER #104	*	2	*	25Jan90	26Jan90	21Mar90	22Mar90 *	38
S	FS		0605	GRAVEL FILL OVER GEOT LINER #104	2		29Jan90	30Jan90	23Mar90	26Mar90	38	
P	FS		058	INSTL GEOT COVER OVER LINER #102	2		29Dec89	L02Jan90	29Dec89	-02Jan90	0	
*****	*****		060	GRAVEL FILL OVER GEOT LINER #102	*	2	*	03Jan90	04Jan90	03Jan90	04Jan90 *	0
S	FS		068	PROTECT GRAVEL FILL #102	1		05Jan90	05Jan90	05Jan90	05Jan90	0	
P	FS		0585	INSTL GEOT COVER OVER LINER #104	2		25Jan90	L26Jan90	21Mar90	22Mar90	38	
*****	*****		0605	GRAVEL FILL OVER GEOT LINER #104	*	2	*	29Jan90	30Jan90	23Mar90	26Mar90 *	38
S	FS		0685	PROTECT GRAVEL FILL #104	1		31Jan90	31Jan90	27Mar90	27Mar90	38	
P	SS	7	046	CURE #103 CB SLAB	20		16Nov89	L15Dec89	16Nov89	15Dec89	0	
P	FF	7	046	CURE #103 CB SLAB	20		16Nov89	15Dec89	16Nov89	15Dec89	0	
P	FS		048	STRIP FORMS #103 C.B. SLAB/ CURB	2		16Nov89	17Nov89	04Dec89	05Dec89	10	
P	FS		054	FACTORY PREPARE LINERS 102/103	30		19Sep89	30Oct89	23Oct89	05Dec89	24	
*****	*****		062	INSTL LINER CB #103	*	15	*	06Dec89	28Dec89	06Dec89	28Dec89 *	0
S	FS		064	INSTL GEOT COVER OVER LINER #103	2		29Dec89	02Jan90	29Dec89	02Jan90	0	
P	SS	7	0465	CURE #105 CB SLAB	20		14Dec89	L15Jan90	26Feb90	23Mar90	48	
P	FF	7	0465	CURE #105 CB SLAB	20		14Dec89	15Jan90	26Feb90	23Mar90	48	
P	FS		0485	STRIP FORMS #105 C.B. SLAB/ CURB	2		14Dec89	15Dec89	12Mar90	13Mar90	58	
P	FS		055	FACTORY PREPARE LINERS 104/105	30		14Nov89	29Dec89	16Jan90	27Feb90	40	
*****	*****		0625	INSTL LINER CB #105	*	15	*	04Jan90	24Jan90	14Mar90	03Apr90 *	48
S	FS		0645	INSTL GEOT COVER OVER LINER #105	2		25Jan90	26Jan90	04Apr90	05Apr90	48	
P	FS		062	INSTL LINER CB #103	15		06Dec89	L28Dec89	06Dec89	28Dec89	0	
*****	*****		064	INSTL GEOT COVER OVER LINER #103	*	2	*	29Dec89	02Jan90	29Dec89	02Jan90 *	0
S	FS		066	GRAVEL FILL OVER GEOT LINER #103	2		03Jan90	04Jan90	03Jan90	04Jan90	0	

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P FS	0625	INSTL LINER CB #105	15	04Jan90	L24Jan90	14Mar90	03Apr90	48
*****	0645	INSTL GEOT COVER OVER LINER #105	*	25Jan90	26Jan90	04Apr90	05Apr90	*
S FS	0665	GRAVEL FILL OVER GEOT LINER #105	2	29Jan90	30Jan90	06Apr90	09Apr90	48
P FS	064	INSTL GEOT COVER OVER LINER #103	2	29Dec89	L02Jan90	29Dec89	02Jan90	0
*****	066	GRAVEL FILL OVER GEOT LINER #103	*	03Jan90	04Jan90	03Jan90	04Jan90	*
S FS	069	PROTECT GRAVEL FILL #103	1	05Jan90	05Jan90	05Jan90	05Jan90	0
P FS	0645	INSTL GEOT COVER OVER LINER #105	2	25Jan90	L26Jan90	04Apr90	05Apr90	48
*****	0665	GRAVEL FILL OVER GEOT LINER #105	*	29Jan90	30Jan90	06Apr90	09Apr90	*
S FS	0695	PROTECT GRAVEL FILL #105	1	31Jan90	31Jan90	10Apr90	10Apr90	48
P FS	060	GRAVEL FILL OVER GEOT LINER #102	2	03Jan90	L04Jan90	03Jan90	04Jan90	0
*****	068	PROTECT GRAVEL FILL #102	*	05Jan90	05Jan90	05Jan90	05Jan90	*
S FS	074	FR & P SLAB FOR VAULT #102	26	08Jan90	12Feb90	08Jan90	12Feb90	0
P FS	0605	GRAVEL FILL OVER GEOT LINER #104	2	29Jan90	L30Jan90	23Mar90	26Mar90	38
*****	0685	PROTECT GRAVEL FILL #104	*	31Jan90	31Jan90	27Mar90	27Mar90	*
S FS	0745	FR & P SLAB FOR VAULT #104	26	13Feb90	21Mar90	28Mar90	02May90	30
P FS	066	GRAVEL FILL OVER GEOT LINER #103	2	03Jan90	L04Jan90	03Jan90	04Jan90	0
*****	069	PROTECT GRAVEL FILL #103	*	05Jan90	05Jan90	05Jan90	05Jan90	*
S FS	076	FR & P SLAB FOR VAULT #103	26	08Jan90	12Feb90	08Jan90	12Feb90	0
P FS	0665	GRAVEL FILL OVER GEOT LINER #105	2	29Jan90	L30Jan90	06Apr90	09Apr90	48
*****	0695	PROTECT GRAVEL FILL #105	*	31Jan90	31Jan90	10Apr90	10Apr90	*
S FS	0765	FR & P SLAB FOR VAULT #105	26	13Feb90	21Mar90	11Apr90	16May90	40
P FS	034	ENCASE LEACHATE COLL. LINER #102	12	16Nov89	L05Dec89	18Dec89	05Jan90	20
P FS	068	PROTECT GRAVEL FILL #102	1	05Jan90	05Jan90	05Jan90	05Jan90	0
*****	074	FR & P SLAB FOR VAULT #102	*	08Jan90	12Feb90	08Jan90	12Feb90	*
S FS	078	CURE SLAB VAULT #102	10	13Feb90	27Feb90	13Feb90	27Feb90	0
P FS	0345	ENCASE LEACHATE COLL. LINER #104	12	16Jan90	L31Jan90	12Mar90	27Mar90	38
P FS	0685	PROTECT GRAVEL FILL #104	1	31Jan90	31Jan90	27Mar90	27Mar90	38
P FS	076	FR & P SLAB FOR VAULT #103	26	08Jan90	12Feb90	08Jan90	12Feb90	0
*****	0745	FR & P SLAB FOR VAULT #104	*	13Feb90	21Mar90	28Mar90	02May90	*
S FS	0785	CURE SLAB VAULT #104	10	22Mar90	04Apr90	03May90	16May90	30

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P	FS		036	ENCASE LEACHATE COLL. LINER #103	12	16Nov89	L05Dec89	18Dec89	05Jan90	20		
P	FS		069	PROTECT GRAVEL FILL #103	1	05Jan90	05Jan90	05Jan90	05Jan90	0		
*****	*****	*****	076	FR & P SLAB FOR VAULT #103	*	26	*	08Jan90	12Feb90	12Feb90 *	0	
S	FS		0745	FR & P SLAB FOR VAULT #104	26	13Feb90	21Mar90	28Mar90	02May90	30		
S	FS		0765	FR & P SLAB FOR VAULT #105	26	13Feb90	21Mar90	11Apr90	16May90	40		
S	FS		080	CURE SLAB VAULT #103	10	13Feb90	27Feb90	13Feb90	27Feb90	0		
P	FS		0365	ENCASE LEACHATE COLL. LINER #105	12	16Jan90	L31Jan90	26Mar90	10Apr90	48		
P	FS		0695	PROTECT GRAVEL FILL #105	1	31Jan90	31Jan90	10Apr90	10Apr90	48		
P	FS		076	FR & P SLAB FOR VAULT #103	*	26	*	08Jan90	12Feb90	12Feb90	0	
*****	*****	*****	0765	FR & P SLAB FOR VAULT #105	*	26	*	13Feb90	21Mar90	11Apr90	16May90 *	40
S	FS		0805	CURE SLAB VAULT #105	10	22Mar90	04Apr90	17May90	31May90	40		
P	FS		074	FR & P SLAB FOR VAULT #102	26	08Jan90	L12Feb90	08Jan90	12Feb90	0		
*****	*****	*****	078	CURE SLAB VAULT #102	*	10	*	13Feb90	27Feb90	13Feb90	27Feb90 *	0
S	FS		088	FR & P WALLS VAULT #102	56	28Feb90	16May90	28Feb90	16May90	0		
P	FS		0745	FR & P SLAB FOR VAULT #104	26	13Feb90	L21Mar90	28Mar90	02May90	30		
*****	*****	*****	0785	CURE SLAB VAULT #104	*	10	*	22Mar90	04Apr90	03May90	16May90 *	30
S	FS		0885	FR & P WALLS VAULT #104	56	17May90	07Aug90	17May90	07Aug90	0		
P	FS		076	FR & P SLAB FOR VAULT #103	26	08Jan90	L12Feb90	08Jan90	12Feb90	0		
*****	*****	*****	080	CURE SLAB VAULT #103	*	10	*	13Feb90	27Feb90	13Feb90	27Feb90 *	0
S	FS		090	FR & P WALLS VAULT #103	56	28Feb90	16May90	28Feb90	16May90	0		
P	FS		0765	FR & P SLAB FOR VAULT #105	26	13Feb90	L21Mar90	11Apr90	16May90	40		
*****	*****	*****	0805	CURE SLAB VAULT #105	*	10	*	22Mar90	04Apr90	17May90	31May90 *	40
S	FS		0905	FR & P WALLS VAULT #105	56	17May90	07Aug90	01Jun90	21Aug90	10		
P	FS		078	CURE SLAB VAULT #102	10	13Feb90	L27Feb90	13Feb90	27Feb90	0		
*****	*****	*****	088	FR & P WALLS VAULT #102	*	56	*	28Feb90	16May90	28Feb90	16May90 *	0
S	FS		091	CURE WALLS VAULT #102	20	17May90	14Jun90	17May90	14Jun90	0		
P	FS		0785	CURE SLAB VAULT #104	10	22Mar90	L04Apr90	03May90	16May90	30		
P	FS		090	FR & P WALLS VAULT #103	56	28Feb90	16May90	28Feb90	16May90	0		
*****	*****	*****	0885	FR & P WALLS VAULT #104	*	56	*	17May90	07Aug90	17May90	07Aug90 *	0
S	FS		0915	CURE WALLS VAULT #104	20	08Aug90	05Sep90	08Aug90	05Sep90	0		

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			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
P	FS		080	CURE SLAB VAULT #103		10		13Feb90	L27Feb90	13Feb90	27Feb90
*****	*****		090	FR & P WALLS VAULT #103	*	56	*	28Feb90	16May90	28Feb90	16May90
S	FS		0885	FR & P WALLS VAULT #104		56		17May90	07Aug90	17May90	07Aug90
S	FS		0905	FR & P WALLS VAULT #105		56		17May90	07Aug90	01Jun90	21Aug90
S	FS		092	CURE WALLS VAULT #103		20		17May90	14Jun90	01Jun90	28Jun90
P	FS		0805	CURE SLAB VAULT #105		10		22Mar90	L04Apr90	17May90	31May90
P	FS		090	FR & P WALLS VAULT #103	*	56		28Feb90	16May90	28Feb90	16May90
*****	*****		0905	FR & P WALLS VAULT #105	*	56	*	17May90	07Aug90	01Jun90	21Aug90
S	FS		0925	CURE WALLS VAULT #105		20		08Aug90	05Sep90	22Aug90	19Sep90
P	FS		088	FR & P WALLS VAULT #102		56		28Feb90	L16May90	28Feb90	16May90
*****	*****		091	CURE WALLS VAULT #102	*	20	*	17May90	14Jun90	17May90	14Jun90
S	FS		093	COAT/CURE VAULT #102 WALLS - ASPHALT		10		15Jun90	28Jun90	15Jun90	28Jun90
P	FS		0885	FR & P WALLS VAULT #104		56		17May90	L07Aug90	17May90	07Aug90
*****	*****		0915	CURE WALLS VAULT #104	*	20	*	08Aug90	05Sep90	08Aug90	05Sep90
S	FS		0935	COAT/CURE VAULT #104 WALLS - ASPHALT		10		06Sep90	19Sep90	06Sep90	19Sep90
P	FS		090	FR & P WALLS VAULT #103		56		28Feb90	L16May90	28Feb90	16May90
*****	*****		092	CURE WALLS VAULT #103	*	20	*	17May90	14Jun90	01Jun90	28Jun90
S	FS		095	COAT/CURE VAULT #103 WALLS - ASPHALT		10		15Jun90	28Jun90	29Jun90	16Jul90
P	FS		0905	FR & P WALLS VAULT #105		56		17May90	L07Aug90	01Jun90	21Aug90
*****	*****		0925	CURE WALLS VAULT #105	*	20	*	08Aug90	05Sep90	22Aug90	19Sep90
S	FS		0955	COAT/CURE VAULT #105 WALLS - ASPHALT		10		06Sep90	19Sep90	20Sep90	03Oct90
P	FS		091	CURE WALLS VAULT #102		20		17May90	L14Jun90	17May90	14Jun90
P	FS		NA13	SUBMITTALS 09885 ASPHALT		22		10Aug89	11Sep89	15May90	14Jun90
*****	*****		093	COAT/CURE VAULT #102 WALLS - ASPHALT	*	10	*	15Jun90	28Jun90	15Jun90	28Jun90
S	FS		094	FILL, HYDRO & EMPTY VAULT #102		10		29Jun90	16Jul90	29Jun90	16Jul90
P	FS		0915	CURE WALLS VAULT #104		20		08Aug90	L05Sep90	08Aug90	05Sep90
P	FS		NA13	SUBMITTALS 09885 ASPHALT		22		10Aug89	11Sep89	15May90	14Jun90
*****	*****		0935	COAT/CURE VAULT #104 WALLS - ASPHALT	*	10	*	06Sep90	19Sep90	06Sep90	19Sep90
S	FS		0945	FILL, HYDRO & EMPTY VAULT #104		10		20Sep90	03Oct90	20Sep90	03Oct90
P	FS		093	COAT/CURE VAULT #102 WALLS - ASPHALT		10		15Jun90	L28Jun90	15Jun90	28Jun90
*****	*****		094	FILL, HYDRO & EMPTY VAULT #102	*	10	*	29Jun90	16Jul90	29Jun90	16Jul90
S	FS		096	FILL, HYDRO & EMPTY VAULT #103		10		17Jul90	30Jul90	17Jul90	30Jul90
S	FS		112	BKFL TO TOP OF WALLS VAULT #102		10		31Jul90	13Aug90	31Jul90	13Aug90
S	FS		A02	DRAINAGE NET #102		10		17Jul90	30Jul90	31Jul90	13Aug90

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					TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS	0935	COAT/CURE VAULT #104 WALLS - ASPHALT		10		06Sep90	L19Sep90	06Sep90	19Sep90	0	
*****	*****	0945	FILL, HYDRO & EMPTY VAULT #104		*	10	*	20Sep90	03Oct90	20Sep90	03Oct90 *	0
S	FS	0965	FILL, HYDRO & EMPTY VAULT #105			10		04Oct90	17Oct90	04Oct90	17Oct90	0
S	FS	113	BKFL TO TOP OF WALLS VAULT #103			10		04Oct90	17Oct90	04Oct90	17Oct90	0
S	FS	A025	DRAINAGE NET #104			10		04Oct90	17Oct90	18Oct90	31Oct90	10
P	FS	092	CURE WALLS VAULT #103		20		17May90	L14Jun90	01Jun90	28Jun90	10	
P	FS	NA13	SUBMITTALS 09885 ASPHALT		22		10Aug89	11Sep89	15May90	14Jun90	191	
*****	*****	095	COAT/CURE VAULT #103 WALLS - ASPHALT		*	10	*	15Jun90	28Jun90	29Jun90	16Jul90 *	10
S	FS	096	FILL, HYDRO & EMPTY VAULT #103			10		17Jul90	30Jul90	17Jul90	30Jul90	0
P	FS	0925	CURE WALLS VAULT #105		20		08Aug90	L05Sep90	22Aug90	19Sep90	10	
P	FS	NA13	SUBMITTALS 09885 ASPHALT		22		10Aug89	11Sep89	15May90	14Jun90	191	
*****	*****	0955	COAT/CURE VAULT #105 WALLS - ASPHALT		*	10	*	06Sep90	19Sep90	20Sep90	03Oct90 *	10
S	FS	0965	FILL, HYDRO & EMPTY VAULT #105			10		04Oct90	17Oct90	04Oct90	17Oct90	0
P	FS	094	FILL, HYDRO & EMPTY VAULT #102		10		29Jun90	L16Jul90	29Jun90	16Jul90	0	
P	FS	095	COAT/CURE VAULT #103 WALLS - ASPHALT		10		15Jun90	28Jun90	29Jun90	16Jul90	10	
*****	*****	096	FILL, HYDRO & EMPTY VAULT #103		*	10	*	17Jul90	30Jul90	17Jul90	30Jul90 *	0
S	FS	112	BKFL TO TOP OF WALLS VAULT #102			10		31Jul90	13Aug90	31Jul90	13Aug90	0
S	FS	113	BKFL TO TOP OF WALLS VAULT #103			10		04Oct90	17Oct90	04Oct90	17Oct90	0
S	FS	A22	DRAINAGE NET #103			10		31Jul90	13Aug90	04Oct90	17Oct90	46
P	FS	0945	FILL, HYDRO & EMPTY VAULT #104		10		20Sep90	L03Oct90	20Sep90	03Oct90	0	
P	FS	0955	COAT/CURE VAULT #105 WALLS - ASPHALT		10		06Sep90	19Sep90	20Sep90	03Oct90	10	
*****	*****	0965	FILL, HYDRO & EMPTY VAULT #105		*	10	*	04Oct90	17Oct90	04Oct90	17Oct90 *	0
S	FS	006	CF GROUND MONITORING WELL			10		18Oct90	31Oct90	18Oct90	31Oct90	0
S	FS	1125	BKFL TO TOP OF WALLS VAULT #104			10		18Oct90	31Oct90	18Oct90	31Oct90	0
S	FS	1135	BKFL TO TOP OF WALLS VAULT #105			10		18Oct90	31Oct90	18Oct90	31Oct90	0
S	FS	A225	DRAINAGE NET #105			10		18Oct90	31Oct90	18Oct90	31Oct90	0
P	FS	027	ASPHALT PROTECTION 102 & 103		2		17Oct89	L18Oct89	17Oct89	18Oct89	0	
P	FS	NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC		22		10Aug89	11Sep89	17Oct89	15Nov89	47	
*****	*****	101	FR & P LEACHATE COLL. PIT FND #102		*	10	*	19Oct89	01Nov89	16Nov89	01Dec89 *	20
S	FS	103	STRIP & CURE LEACH. COLL. PIT FND 102			10		02Nov89	15Nov89	04Dec89	15Dec89	20
P	FS	0275	ASPHALT PROTECTION 104 & 105		2		19Oct89	L20Oct89	10Jan90	11Jan90	54	
P	FS	S100	SUBMITTALS FOR VAULTS 104-105		30		03Oct89	13Nov89	28Nov89	11Jan90	38	
*****	*****	1015	FR & P LEACHATE COLL. PIT FND #104		*	10	*	14Nov89	29Nov89	09Feb90	23Feb90 *	58
S	FS	1035	STRIP & CURE LEACH. COLL. PIT FND 104			10		30Nov89	13Dec89	26Feb90	09Mar90	58

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P FS	027	ASPHALT PROTECTION 102 & 103	2	17Oct89	L18Oct89	17Oct89	18Oct89	0
*****	102	FR & P LEACHATE COLL. PIT FND #103	*	10	* 19Oct89	01Nov89	16Nov89	01Dec89 *
S FS	104	STRIP & CURE LEACH. COLL. PIT FND 103	10		02Nov89	15Nov89	04Dec89	15Dec89 20
P FS	0275	ASPHALT PROTECTION 104 & 105	2	19Oct89	L20Oct89	10Jan90	11Jan90	54
P FS	S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	13Nov89	28Nov89	11Jan90	38
*****	1025	FR & P LEACHATE COLL. PIT FND #105	*	10	* 14Nov89	29Nov89	26Feb90	09Mar90 *
S FS	1045	STRIP & CURE LEACH. COLL. PIT FND 105	10		30Nov89	13Dec89	12Mar90	23Mar90 68
P FS	101	FR & P LEACHATE COLL. PIT FND #102	2	19Oct89	L01Nov89	16Nov89	01Dec89	20
*****	103	STRIP & CURE LEACH. COLL. PIT FND 102	*	10	* 02Nov89	15Nov89	04Dec89	15Dec89 *
S FS	034	ENCASE LEACHATE COLL. LINER #102	12		16Nov89	05Dec89	18Dec89	05Jan90 20
P FS	1015	FR & P LEACHATE COLL. PIT FND #104	2	14Nov89	L29Nov89	09Feb90	23Feb90	58
*****	1035	STRIP & CURE LEACH. COLL. PIT FND 104	*	10	* 30Nov89	13Dec89	26Feb90	09Mar90 *
S FS	0345	ENCASE LEACHATE COLL. LINER #104	12		16Jan90	31Jan90	12Mar90	27Mar90 38
P FS	102	FR & P LEACHATE COLL. PIT FND #103	2	19Oct89	L01Nov89	16Nov89	01Dec89	20
P FS	NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC	22	10Aug89	11Sep89	17Oct89	15Nov89	47
*****	104	STRIP & CURE LEACH. COLL. PIT FND 103	*	10	* 02Nov89	15Nov89	04Dec89	15Dec89 *
S FS	036	ENCASE LEACHATE COLL. LINER #103	12		16Nov89	05Dec89	18Dec89	05Jan90 20
P FS	1025	FR & P LEACHATE COLL. PIT FND #105	2	14Nov89	L29Nov89	26Feb90	09Mar90	68
*****	1045	STRIP & CURE LEACH. COLL. PIT FND 105	*	10	* 30Nov89	13Dec89	12Mar90	23Mar90 *
S FS	0365	ENCASE LEACHATE COLL. LINER #105	12		16Jan90	31Jan90	26Mar90	10Apr90 48
P FS	034	ENCASE LEACHATE COLL. LINER #102	2	16Nov89	L05Dec89	18Dec89	05Jan90	20
*****	106	LEACHATE 26" RISER PIPE #102	*	12	* 06Dec89	08Dec89	26Jul90	30Jul90 *
S FS	112	BKFL TO TOP OF WALLS VAULT #102	3		31Jul90	13Aug90	31Jul90	13Aug90 0
P FS	0345	ENCASE LEACHATE COLL. LINER #104	2	16Jan90	L31Jan90	12Mar90	27Mar90	38
*****	1065	LEACHATE 26" RISER PIPE #104	*	12	* 01Feb90	05Feb90	15Oct90	17Oct90 *
S FS	1125	BKFL TO TOP OF WALLS VAULT #104	3		18Oct90	31Oct90	18Oct90	31Oct90 0
P FS	036	ENCASE LEACHATE COLL. LINER #103	2	16Nov89	L05Dec89	18Dec89	05Jan90	20
*****	108	LEACHATE 26" RISER PIPE #103	*	12	* 06Dec89	08Dec89	01Oct90	03Oct90 *
S FS	113	BKFL TO TOP OF WALLS VAULT #103	3		04Oct90	17Oct90	04Oct90	17Oct90 0
P FS	0365	ENCASE LEACHATE COLL. LINER #105	2	16Jan90	L31Jan90	26Mar90	10Apr90	48
*****	1085	LEACHATE 26" RISER PIPE #105	*	12	* 01Feb90	05Feb90	15Oct90	17Oct90 *
S FS	1135	BKFL TO TOP OF WALLS VAULT #105	3		18Oct90	31Oct90	18Oct90	31Oct90 0

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			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
P	FS	094	FILL, HYDRO & EMPTY VAULT	#102	10		29Jun90	16Jul90	29Jun90	16Jul90	0
P	FS	096	FILL, HYDRO & EMPTY VAULT	#103	10		17Jul90	30Jul90	17Jul90	30Jul90	0
P	FS	106	LEACHATE 26" RISER PIPE	#102	3		06Dec89	08Dec89	26Jul90	30Jul90	159
*****	*****	112	BKFL TO TOP OF WALLS	VAULT #102	*	10	31Jul90	13Aug90	31Jul90	13Aug90	*
S	FS	156	SET ROOF PANELS	#102	5		14Aug90	20Aug90	14Aug90	20Aug90	0
S	FS	404	INSTALL ELECTRICAL	#102	30		14Aug90	25Sep90	22Jan91	05Mar91	109
S	FS	P112	EXCAV FOR PIPES TO	102/103	2		14Aug90	15Aug90	25Sep90	26Sep90	29
P	FS	0965	FILL, HYDRO & EMPTY VAULT	#105	10		04Oct90	17Oct90	04Oct90	17Oct90	0
P	FS	1065	LEACHATE 26" RISER PIPE	#104	3		01Feb90	05Feb90	15Oct90	17Oct90	177
*****	*****	1125	BKFL TO TOP OF WALLS	VAULT #104	*	10	180Oct90	31Oct90	180Oct90	31Oct90	*
S	FS	1565	SET ROOF PANELS	#104	5		01Nov90	07Nov90	01Nov90	07Nov90	0
S	FS	405	INSTALL ELECTRICAL	#103 & #104	30		01Nov90	14Dec90	05Feb91	19Mar91	63
P	FS	0945	FILL, HYDRO & EMPTY VAULT	#104	10		20Sep90	03Oct90	20Sep90	03Oct90	0
P	FS	096	FILL, HYDRO & EMPTY VAULT	#103	10		17Jul90	30Jul90	17Jul90	30Jul90	0
P	FS	108	LEACHATE 26" RISER PIPE	#103	3		06Dec89	08Dec89	01Oct90	03Oct90	205
*****	*****	113	BKFL TO TOP OF WALLS	VAULT #103	*	10	04Oct90	17Oct90	04Oct90	17Oct90	*
S	FS	160	SET ROOF PANELS	#103	5		18Oct90	24Oct90	18Oct90	24Oct90	0
S	FS	405	INSTALL ELECTRICAL	#103 & #104	30		01Nov90	14Dec90	05Feb91	19Mar91	63
P	FS	0965	FILL, HYDRO & EMPTY VAULT	#105	10		04Oct90	17Oct90	04Oct90	17Oct90	0
P	FS	1085	LEACHATE 26" RISER PIPE	#105	3		01Feb90	05Feb90	15Oct90	17Oct90	177
*****	*****	1135	BKFL TO TOP OF WALLS	VAULT #105	*	10	180Oct90	31Oct90	180Oct90	31Oct90	*
S	FS	1605	SET ROOF PANELS	#105	5		01Nov90	07Nov90	01Nov90	07Nov90	0
S	FS	4055	INSTALL ELECTRICAL	#105	30		01Nov90	14Dec90	20Feb91	02Apr91	73
S	FS	P1125	EXCAV FOR PIPES TO	104/105	2		01Nov90	02Nov90	14Dec90	17Dec90	29

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NUMBER			TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
008	START PROJECT CONSTRUCTION								
148	BID & AWARD KEH-5162 GROUT VAULT	*	85	* E10Apr89	09Aug89	10Apr89	09Aug89	*	0
020	SUBMITTALS, DIV 1 & GC KEH-5162		15	10Aug89	30Aug89	10Aug89	30Aug89	0	
021	KEH-5162 NOTICE TO PROCEED		1	10Aug89	10Aug89	29Aug89	29Aug89	13	
052	SUBMIT/APPR LINER QA PLAN		5	10Aug89	16Aug89	14Sep89	20Sep89	24	
150	SUBM. APPR; 03419 - ROOF PANELS		22	10Aug89	11Sep89	11Jun90	12Jul90	209	
214	SUBMITTALS 15493 PIPELINES 102/103		22	10Aug89	11Sep89	09May90	08Jun90	187	
240	WHC FAB LCH INSTR. ASSYS 102/103		100	E02Apr90	22Aug90	11Oct90	07Mar91	134	
2405	WHC FAB LCH INSTR. ASSYS 104/105		100	E04Sep90	28Jan91	25Oct90	21Mar91	37	
244	WHC FAB PMP ASS & PRCH PMP 102/103		100	E02Apr90	22Aug90	08Oct90	04Mar91	131	
2445	WHC FAB PMP ASS & PRCH PMP 104/105		100	E02Apr90	22Aug90	22Oct90	18Mar91	141	
250	KEH FAB JUMPERS/LEACHATE PIT 102/103		60	E02Apr90	25Jun90	12Dec90	11Mar91	176	
2505	KEH FAB JUMPERS/LEACHATE PIT 104/105		60	E02Apr90	25Jun90	28Dec90	25Mar91	186	
252	KEH FAB JUMPERS/EXC WTR PIT 102/103		60	E02Apr90	25Jun90	11Dec90	08Mar91	175	
2525	KEH FAB JUMPERS/EXC WTR PIT 104/105		60	E02Apr90	25Jun90	27Dec90	22Mar91	185	
254	WHC MODIFY JUMPER FOR V PITS 102/103		20	E02Apr90	27Apr90	05Feb91	05Mar91	212	
2545	WHC MODIFY JUMPER FOR V PITS 104/105		20	E02Apr90	27Apr90	20Feb91	19Mar91	222	
400	ELEC SUBMITTALS 16300, 16400 & 16640		22	10Aug89	11Sep89	25Jul90	23Aug90	239	
NA12	SUBMITTALS 03301 CONC 05500 METAL		22	10Aug89	11Sep89	19Sep89	18Oct89	27	
NA13	SUBMITTALS 09885 ASPHALT		22	10Aug89	11Sep89	15May90	14Jun90	191	
NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC		22	10Aug89	11Sep89	17Oct89	15Nov89	47	
NA15	SUBMITTALS 13440 INSTR		22	10Aug89	11Sep89	25Jul90	23Aug90	239	
NA17	SUBMITTALS 09805 SPC CVR BLKS		22	10Aug89	11Sep89	13Sep90	12Oct90	274	
NA3	KEH-5162 FINALIZE/APPR QA PROGRAM		5	10Aug89	16Aug89	30Aug89	06Sep89	14	
NA6	SUBM 02145 GRAVEL DIFF. BRK.		22	10Aug89	11Sep89	17Aug89	18Sep89	5	
P106	SUBM - LCHT SUMP/RISER (4EA)		22	10Aug89	11Sep89	19Sep89	18Oct89	27	
148	BID & AWARD KEH-5162 GROUT VAULT								
150	SUBM. APPR; 03419 - ROOF PANELS	*	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
NA7	FAB/DEL ROOF PANELS 102	*	22	10Aug89	11Sep89	11Jun90	12Jul90	*	209
NA71	FAB/DEL ROOF PANELS 103		22	12Sep89	11Oct89	13Jul90	13Aug90	209	
12Sep89			22	12Sep89	11Oct89	18Sep90	17Oct90	255	
112	BKFL TO TOP OF WALLS VAULT #102		10	31Jul90	L13Aug90	31Jul90	13Aug90	0	
A02	DRAINAGE NET #102		10	17Jul90	30Jul90	31Jul90	13Aug90	10	
NA7	FAB/DEL ROOF PANELS 102		22	12Sep89	11Oct89	13Jul90	13Aug90	209	
156	SET ROOF PANELS #102	*	5	14Aug90	20Aug90	14Aug90	20Aug90	*	0
164	SEAL ROOF PANELS #102		5	21Aug90	27Aug90	21Aug90	27Aug90	0	

P FS	112	BKFL TO TOP OF WALLS VAULT #102	10	31Jul90	L13Aug90	31Jul90	13Aug90	0		
P FS	A02	DRAINAGE NET #102	10	17Jul90	30Jul90	31Jul90	13Aug90	10		
P FS	NA7	FAB/DEL ROOF PANELS 102	22	12Sep89	11Oct89	13Jul90	13Aug90	209		
*****	156	SET ROOF PANELS #102	*	5	14Aug90	20Aug90	14Aug90	20Aug90	*	0
S FS	164	SEAL ROOF PANELS #102		5	21Aug90	27Aug90	21Aug90	27Aug90	0	

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
					TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		1125	BKFL TO TOP OF WALLS VAULT #104	10		180ct90	L310ct90	180ct90	31Oct90	0	
P	FS		A025	DRAINAGE NET #104	10		04Oct90	17Oct90	18Oct90	31Oct90	10	
P	FS		NA75	FAB/DEL ROOF PANELS 104/105	22		14Nov89	15Dec89	02Oct90	31Oct90	220	
*****	*****		1565	SET ROOF PANELS #104	*	5	*	01Nov90	07Nov90	01Nov90	07Nov90 *	0
S	FS		1645	SEAL ROOF PANELS #104		5		08Nov90	14Nov90	08Nov90	14Nov90	0
P	FS		113	BKFL TO TOP OF WALLS VAULT #103	10		04Oct90	L170ct90	04Oct90	17Oct90	0	
P	FS		A22	DRAINAGE NET #103	10		31Jul90	13Aug90	04Oct90	17Oct90	46	
P	FS		NA71	FAB/DEL ROOF PANELS 103	22		12Sep89	11Oct89	18Sep90	17Oct90	255	
*****	*****		160	SET ROOF PANELS #103	*	5	*	180ct90	24Oct90	18Oct90	24Oct90 *	0
S	FS		166	SEAL ROOF PANELS #103		5		250ct90	31Oct90	25Oct90	31Oct90	0
P	FS		006	CF GROUND MONITORING WELL	10		180ct90	L310ct90	180ct90	31Oct90	0	
P	FS		1135	BKFL TO TOP OF WALLS VAULT #105	10		180ct90	31Oct90	180ct90	31Oct90	0	
P	FS		A225	DRAINAGE NET #105	10		180ct90	31Oct90	180ct90	31Oct90	0	
P	FS		NA75	FAB/DEL ROOF PANELS 104/105	22		14Nov89	15Dec89	02Oct90	31Oct90	220	
*****	*****		1605	SET ROOF PANELS #105	*	5	*	01Nov90	07Nov90	01Nov90	07Nov90 *	0
S	FS		1665	SEAL ROOF PANELS #105		5		08Nov90	14Nov90	08Nov90	14Nov90	0
P	FS		156	SET ROOF PANELS #102		5		14Aug90	L20Aug90	14Aug90	20Aug90	0
*****	*****		164	SEAL ROOF PANELS #102	*	5	*	21Aug90	27Aug90	21Aug90	27Aug90 *	0
S	FS		170	FR & P 4 EXCESS WTR PITS #102		15		28Aug90	18Sep90	28Aug90	18Sep90	0
S	FS		174	FR & P VALVE PIT #102		12		28Aug90	13Sep90	31Aug90	18Sep90	3
S	FS		178	FR & P LEACHATE PIT #102		7		28Aug90	06Sep90	28Sep90	08Oct90	22
S	FS		A01	PENETRATIONS IN ROOF PANELS #102		10		28Aug90	11Sep90	07Feb91	21Feb91	111
P	FS		1565	SET ROOF PANELS #104		5		01Nov90	L07Nov90	01Nov90	07Nov90	0
*****	*****		1645	SEAL ROOF PANELS #104	*	5	*	08Nov90	14Nov90	08Nov90	14Nov90 *	0
S	FS		1705	FR & P 4 EXCESS WTR PITS #104		15		15Nov90	07Dec90	15Nov90	07Dec90	0
S	FS		1745	FR & P VALVE PIT #104		12		15Nov90	04Dec90	20Nov90	07Dec90	3
S	FS		1785	FR & P LEACHATE PIT #104		7		15Nov90	27Nov90	19Dec90	31Dec90	22
S	FS		A015	PENETRATIONS IN ROOF PANELS #104		10		15Nov90	30Nov90	07Feb91	21Feb91	55
P	FS		160	SET ROOF PANELS #103		5		180ct90	L240ct90	180ct90	24Oct90	0
*****	*****		166	SEAL ROOF PANELS #103	*	5	*	250ct90	31Oct90	25Oct90	31Oct90 *	0
S	FS		172	FR & P 4 EXCESS WTR PITS #103		15		01Nov90	21Nov90	01Nov90	21Nov90	0
S	FS		176	FR & P VALVE PIT #103		12		01Nov90	16Nov90	06Nov90	21Nov90	3
S	FS		180	FR & P LEACHATE PIT #103		7		01Nov90	09Nov90	05Dec90	13Dec90	22
S	FS		A11	PENETRATIONS IN ROOF PANELS #103		10		01Nov90	14Nov90	07Feb91	21Feb91	65

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT
P	FS		1665	SEAL ROOF PANELS #105	5	08Nov90	L14Nov90	08Nov90	14Nov90	0
*****	*****		1765	FR & P VALVE PIT #105	*	15Nov90	04Dec90	20Nov90	07Dec90	*
S	FS		2025	FR & P CAP OVER ROOF PANELS #105	7	10Dec90	18Dec90	10Dec90	18Dec90	0
S	FS		P1185	PAINT & ID MARKINGS #105	5	10Dec90	14Dec90	21Dec90	31Dec90	9
P	FS		164	SEAL ROOF PANELS #102	5	21Aug90	L27Aug90	21Aug90	27Aug90	0
P	FS		NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC	22	10Aug89	11Sep89	17Oct89	15Nov89	47
*****	*****		178	FR & P LEACHATE PIT #102	*	28Aug90	06Sep90	28Sep90	08Oct90	*
S	FS		210	BKFL 3' OVER ROOF CAP VAULT #102	4	09Oct90	12Oct90	09Oct90	12Oct90	0
S	FS		264	WHC INSTR TREE/PMP LEACHATE TK #102	2	07Sep90	10Sep90	08Mar91	11Mar91	124
P	FS		1645	SEAL ROOF PANELS #104	5	08Nov90	L14Nov90	08Nov90	14Nov90	0
*****	*****		1785	FR & P LEACHATE PIT #104	*	15Nov90	27Nov90	19Dec90	31Dec90	*
S	FS		2105	BKFL 3' OVER ROOF CAP VAULT #104	4	02Jan91	07Jan91	02Jan91	07Jan91	0
S	FS		2645	WHC INSTR TREE/PMP LEACHATE TK #104	2	29Jan91	30Jan91	22Mar91	25Mar91	37
P	FS		166	SEAL ROOF PANELS #103	5	25Oct90	L31Oct90	25Oct90	31Oct90	0
*****	*****		180	FR & P LEACHATE PIT #103	*	01Nov90	09Nov90	05Dec90	13Dec90	*
S	FS		211	BKFL 3' OVER ROOF CAP VAULT #103	4	14Dec90	19Dec90	14Dec90	19Dec90	0
S	FS		266	WHC INSTR TREE/PMP LEACHATE TK #103	2	12Nov90	13Nov90	22Mar91	25Mar91	88
P	FS		1665	SEAL ROOF PANELS #105	5	08Nov90	L14Nov90	08Nov90	14Nov90	0
*****	*****		1805	FR & P LEACHATE PIT #105	*	15Nov90	27Nov90	19Dec90	31Dec90	*
S	FS		2115	BKFL 3' OVER ROOF CAP VAULT #105	4	02Jan91	07Jan91	02Jan91	07Jan91	0
S	FS		2665	WHC INSTR TREE/PMP LEACHATE TK #105	2	29Jan91	30Jan91	05Apr91	08Apr91	47
P	FS		170	FR & P 4 EXCESS WTR PITS #102	15	28Aug90	L18Sep90	28Aug90	18Sep90	0
P	FS		174	FR & P VALVE PIT #102	12	28Aug90	13Sep90	31Aug90	18Sep90	3
*****	*****		200	FR & P CAP OVER ROOF PANELS #102	*	19Sep90	27Sep90	19Sep90	27Sep90	*
S	FS		204	CURE CAP OVER VAULT ROOF PANELS 102	7	28Sep90	08Oct90	28Sep90	08Oct90	0
P	FS		1705	FR & P 4 EXCESS WTR PITS #104	15	15Nov90	L07Dec90	15Nov90	07Dec90	0
P	FS		1745	FR & P VALVE PIT #104	12	15Nov90	04Dec90	20Nov90	07Dec90	3
*****	*****		2005	FR & P CAP OVER ROOF PANELS #104	*	10Dec90	18Dec90	10Dec90	18Dec90	*
S	FS		2045	CURE CAP OVER VAULT ROOF PANELS 104	7	19Dec90	31Dec90	19Dec90	31Dec90	0
P	FS		172	FR & P 4 EXCESS WTR PITS #103	15	01Nov90	L21Nov90	01Nov90	21Nov90	0
P	FS		176	FR & P VALVE PIT #103	12	01Nov90	16Nov90	06Nov90	21Nov90	3
*****	*****		202	FR & P CAP OVER ROOF PANELS #103	*	26Nov90	04Dec90	26Nov90	04Dec90	*
S	FS		206	CURE CAP OVER VAULT ROOF PANELS 103	7	05Dec90	13Dec90	05Dec90	13Dec90	0

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			TOTAL	START	FINISH	START	FINISH	FLOAT
			REM.					
P FS	1725	FR & P 4 EXCESS WTR PITS #105	15	15Nov90	L07Dec90	15Nov90	07Dec90	0
P FS	1765	FR & P VALVE PIT #105	12	15Nov90	04Dec90	20Nov90	07Dec90	3
*****	2025	FR & P CAP OVER ROOF PANELS #105	*	7	*	10Dec90	18Dec90	10Dec90
S FS	2065	CURE CAP OVER VAULT ROOF PANELS 105	7	19Dec90	31Dec90	19Dec90	31Dec90	0
P FS	200	FR & P CAP OVER ROOF PANELS #102	7	19Sep90	L27Sep90	19Sep90	27Sep90	0
*****	204	CURE CAP OVER VAULT ROOF PANELS 102	*	7	*	28Sep90	08Oct90	28Sep90
S FS	210	BKFL 3' OVER ROOF CAP VAULT #102	4	09Oct90	12Oct90	09Oct90	12Oct90	0
P FS	2005	FR & P CAP OVER ROOF PANELS #104	7	10Dec90	L18Dec90	10Dec90	18Dec90	0
*****	2045	CURE CAP OVER VAULT ROOF PANELS 104	*	7	*	19Dec90	31Dec90	19Dec90
S FS	2105	BKFL 3' OVER ROOF CAP VAULT #104	4	02Jan91	07Jan91	02Jan91	07Jan91	0
P FS	202	FR & P CAP OVER ROOF PANELS #103	7	26Nov90	L04Dec90	26Nov90	04Dec90	0
*****	206	CURE CAP OVER VAULT ROOF PANELS 103	*	7	*	05Dec90	13Dec90	05Dec90
S FS	211	BKFL 3' OVER ROOF CAP VAULT #103	4	14Dec90	19Dec90	14Dec90	19Dec90	0
P FS	2025	FR & P CAP OVER ROOF PANELS #105	7	10Dec90	L18Dec90	10Dec90	18Dec90	0
*****	2065	CURE CAP OVER VAULT ROOF PANELS 105	*	7	*	19Dec90	31Dec90	19Dec90
S FS	2115	BKFL 3' OVER ROOF CAP VAULT #105	4	02Jan91	07Jan91	02Jan91	07Jan91	0
P FS	178	FR & P LEACHATE PIT #102	7	28Aug90	L06Sep90	28Sep90	08Oct90	22
P FS	204	CURE CAP OVER VAULT ROOF PANELS 102	7	28Sep90	08Oct90	28Sep90	08Oct90	0
P FS	P117	PAINT & ID MARKINGS #102	5	19Sep90	25Sep90	02Oct90	08Oct90	9
*****	210	BKFL 3' OVER ROOF CAP VAULT #102	*	4	*	09Oct90	12Oct90	09Oct90
S FS	220	RUN PIPE LINES TO VALVE PIT #102	20	18Oct90	14Nov90	18Oct90	14Nov90	0
S FS	262	EXCAVATE FOR PIPE OVER #102	3	15Oct90	17Oct90	15Oct90	17Oct90	0
S FS	907	DUST COVER OVER GRAVEL BARRIER #102	5	15Oct90	19Oct90	01Mar91	07Mar91	93
P FS	1785	FR & P LEACHATE PIT #104	7	15Nov90	L27Nov90	19Dec90	31Dec90	22
P FS	2045	CURE CAP OVER VAULT ROOF PANELS 104	7	19Dec90	31Dec90	19Dec90	31Dec90	0
P FS	P1175	PAINT & ID MARKINGS #104	5	10Dec90	14Dec90	21Dec90	31Dec90	9
*****	2105	BKFL 3' OVER ROOF CAP VAULT #104	*	4	*	02Jan91	07Jan91	02Jan91
S FS	2205	RUN PIPE LINES TO VALVE PIT #104	20	11Jan91	07Feb91	11Jan91	07Feb91	0
S FS	2625	EXCAVATE FOR PIPE OVER #104	3	08Jan91	10Jan91	08Jan91	10Jan91	0
S FS	9075	DUST COVER OVER GRAVEL BARRIER #104	5	08Jan91	14Jan91	01Mar91	07Mar91	37

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT
P	FS	180	FR & P LEACHATE PIT #103		7	01Nov90	L09Nov90	05Dec90	13Dec90	22
P	FS	206	CURE CAP OVER VAULT ROOF PANELS 103		7	05Dec90	13Dec90	05Dec90	13Dec90	0
P	FS	P118	PAINT & ID MARKINGS #103		5	26Nov90	30Nov90	07Dec90	13Dec90	9
*****	*****	211	BKFL 3' OVER ROOF CAP VAULT #103	*	4	* 14Dec90	19Dec90	14Dec90	19Dec90	*
S	FS	224	RUN PIPE LINES TO VALVE PIT #103		20	27Dec90	24Jan91	11Jan91	07Feb91	10
S	FS	263	EXCAVATE FOR PIPE OVER #103		3	20Dec90	26Dec90	08Jan91	10Jan91	10
S	FS	908	DUST COVER OVER GRAVEL BARRIER #103		5	20Dec90	28Dec90	01Mar91	07Mar91	47
S	FS	960	BID/AWARD CP 4A CL CVR/ROADS 102/103		60	E20Dec90	19Mar91	20Feb91	14May91	40
S	FS	P107	BID & AWARD CLSR CVR/ROADS 102/103		40	20Dec90	19Feb91	20Dec90	19Feb91	0
P	FS	1805	FR & P LEACHATE PIT #105		7	15Nov90	L27Nov90	19Dec90	31Dec90	22
P	FS	2065	CURE CAP OVER VAULT ROOF PANELS 105		7	19Dec90	31Dec90	19Dec90	31Dec90	0
P	FS	P1185	PAINT & ID MARKINGS #105		5	10Dec90	14Dec90	21Dec90	31Dec90	9
*****	*****	2115	BKFL 3' OVER ROOF CAP VAULT #105	*	4	* 02Jan91	07Jan91	02Jan91	07Jan91	*
S	FS	2245	RUN PIPE LINES TO VALVE PIT #105		20	11Jan91	07Feb91	11Jan91	07Feb91	0
S	FS	2635	EXCAVATE FOR PIPE OVER #105		3	08Jan91	10Jan91	08Jan91	10Jan91	0
S	FS	9085	DUST COVER OVER GRAVEL BARRIER #105		5	08Jan91	14Jan91	01Mar91	07Mar91	37
S	FS	9605	BID/AWARD CP 4B CL CVR/ROADS 104/105		60	E08Jan91	02Apr91	06Mar91	29May91	40
S	FS	P1075	BID & AWARD CLSR CVR/ROADS 104/105		40	08Jan91	05Mar91	08Jan91	05Mar91	0
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT							
*****	*****	214	SUBMITTALS 15493 PIPELINES 102/103	*	85	10Apr89	L09Aug89	10Apr89	09Aug89	0
S	FS	215	PREFAB PIPELINES 102/103	*	22	* 10Aug89	11Sep89	09May90	08Jun90	*
					75	12Sep89	29Dec89	11Jun90	26Sep90	187
P	FS	214	SUBMITTALS 15493 PIPELINES 102/103							
P	FS	282	WHC FURN NOZZLES, PLATES & CONN 102/103							
*****	*****	215	PREFAB PIPELINES 102/103	*	40	10Aug89	L11Sep89	09May90	08Jun90	187
S	FS	220	RUN PIPE LINES TO VALVE PIT #102							
S	FS	224	RUN PIPE LINES TO VALVE PIT #103							
S	FS	P113	INSTL PIPES TO 102/103							
P	FS	2113	INSTL PIPES TO 102/103		15	01Jun89	L28Jul89	05Jul90	29Aug90	273
P	FS	2825	WHC FURN NOZZLES, PLATES & CONN 104/105							
P	FS	\$100	SUBMITTALS FOR VAULTS 104-105							
*****	*****	2155	PREFAB PIPELINES 104/105	*	30	01Jun89	L28Jul89	05Jul90	29Aug90	38
S	FS	2205	RUN PIPE LINES TO VALVE PIT #104							
S	FS	2245	RUN PIPE LINES TO VALVE PIT #105							
S	FS	P1135	INSTL PIPES TO 104/105							
					75	* 03Oct89	13Nov89	28Nov89	11Jan90	198
					15	* 11Jan91	07Feb91	11Jan91	07Feb91	0
					20	11Jan91	07Feb91	11Jan91	07Feb91	0
					20	11Jan91	07Feb91	11Jan91	07Feb91	0
					15	05Nov90	27Nov90	18Dec90	10Jan91	29

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			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		210	BKFL 3' OVER ROOF CAP VAULT #102	4		09Oct90	12Oct90	09Oct90	12Oct90	0	
P	FS		215	PREFAB PIPELINES 102/103	75		12Sep89	29Dec89	11Jun90	26Sep90	187	
P	FS		262	EXCAVATE FOR PIPE OVER #102	3		15Oct90	17Oct90	15Oct90	17Oct90	0	
P	FS		P113	INSTL PIPES TO 102/103	15		16Aug90	06Sep90	27Sep90	17Oct90	29	
*****	*****	*****	220	RUN PIPE LINES TO VALVE PIT #102	*	20	*	18Oct90	14Nov90	18Oct90	14Nov90	*
S	FS		260	BERM 3' BKFL OVER NEW PIPELINES #102	4		26Nov90	29Nov90	26Nov90	29Nov90	0	
S	FS		274	WHC INSTL PUMP IN VALVE PIT #102	1		15Nov90	15Nov90	05Mar91	05Mar91	72	
S	FS		286	WHC / PMP IN EXCESS WATER PITS #102	1		15Nov90	15Nov90	08Mar91	08Mar91	75	
S	FS		P115	URETHANE FOAM PIPE BENDS #102	5		15Nov90	21Nov90	15Nov90	21Nov90	0	
P	FS		2105	BKFL 3' OVER ROOF CAP VAULT #104	4		02Jan91	07Jan91	02Jan91	07Jan91	0	
P	FS		2155	PREFAB PIPELINES 104/105	75		14Nov89	06Mar90	30Aug90	17Dec90	198	
P	FS		2625	EXCAVATE FOR PIPE OVER #104	3		08Jan91	10Jan91	08Jan91	10Jan91	0	
P	FS		P1135	INSTL PIPES TO 104/105	15		05Nov90	27Nov90	18Dec90	10Jan91	29	
*****	*****	*****	2205	RUN PIPE LINES TO VALVE PIT #104	*	20	*	11Jan91	07Feb91	11Jan91	07Feb91	*
S	FS		2605	BERM 3' BKFL OVER NEW PIPELINES #104	4		15Feb91	21Feb91	15Feb91	21Feb91	0	
S	FS		2745	WHC INSTL PUMP IN VALVE PIT #104	1		08Feb91	08Feb91	19Mar91	19Mar91	26	
S	FS		2865	WHC / PMP IN EXCESS WATER PITS #104	1		08Feb91	08Feb91	22Mar91	22Mar91	29	
S	FS		P1155	URETHANE FOAM PIPE BENDS #104	5		08Feb91	14Feb91	08Feb91	14Feb91	0	
P	FS		P113	INSTL PIPES TO 102/103	15		16Aug90	06Sep90	27Sep90	17Oct90	29	
*****	*****	*****	222	CATHODIC PROTECTION FOR PIPE TO #102	*	15	*	07Sep90	27Sep90	27Feb91	19Mar91	*
S	FS		890	WHC CATH. PROT. ATP, #101, #102 & TGE	5		28Sep90	04Oct90	20Mar91	26Mar91	117	
P	FS		P1135	INSTL PIPES TO 104/105	15		05Nov90	27Nov90	18Dec90	10Jan91	29	
*****	*****	*****	2225	CATHODIC PROTECTION FOR PIPE TO #104	*	15	*	28Nov90	18Dec90	13Mar91	02Apr91	*
S	FS		8905	WHC CATHODIC PROTECTION ATP #104	5		19Dec90	27Dec90	03Apr91	09Apr91	71	
P	FS		211	BKFL 3' OVER ROOF CAP VAULT #103	4		14Dec90	19Dec90	14Dec90	19Dec90	0	
P	FS		215	PREFAB PIPELINES 102/103	75		12Sep89	29Dec89	11Jun90	26Sep90	187	
P	FS		263	EXCAVATE FOR PIPE OVER #103	3		20Dec90	26Dec90	08Jan91	10Jan91	10	
P	FS		P113	INSTL PIPES TO 102/103	15		16Aug90	06Sep90	27Sep90	17Oct90	29	
*****	*****	*****	224	RUN PIPE LINES TO VALVE PIT #103	*	20	*	27Dec90	24Jan91	11Jan91	07Feb91	*
S	FS		261	BERM 3' BKFL OVER NEW PIPELINES #103	4		01Feb91	06Feb91	15Feb91	21Feb91	10	
S	FS		276	WHC INSTL PUMP IN VALVE PIT #103	1		25Jan91	25Jan91	19Mar91	19Mar91	36	
S	FS		288	WHC / PMP IN EXCESS WATER PITS #103	1		25Jan91	25Jan91	22Mar91	22Mar91	39	
S	FS		P116	URETHANE FOAM PIPE BENDS #103	5		25Jan91	31Jan91	08Feb91	14Feb91	10	

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				TOTAL	REM.	START	FINISH		
P FS	2115	BKFL 3' OVER ROOF CAP VAULT #105	4			02Jan91	L07Jan91	02Jan91	07Jan91 0
P FS	2155	PREFAB PIPELINES 104/105	75			14Nov89	06Mar90	30Aug90	17Dec90 198
P FS	2635	EXCAVATE FOR PIPE OVER #105	3			08Jan91	10Jan91	08Jan91	10Jan91 0
P FS	P1135	INSTL PIPES TO 104/105	15			05Nov90	27Nov90	18Dec90	10Jan91 29
*****	2245	RUN PIPE LINES TO VALVE PIT #105	*	20	*	11Jan91	07Feb91	11Jan91	07Feb91 *
S FS	2615	BERM 3' BKFL OVER NEW PIPELINES #105	4			15Feb91	21Feb91	15Feb91	21Feb91 0
S FS	2765	WHC INSTL PUMP IN VALVE PIT #105	1			08Feb91	08Feb91	02Apr91	02Apr91 36
S FS	2885	WHC / PMP IN EXCESS WATER PITS #105	1			08Feb91	08Feb91	05Apr91	05Apr91 39
S FS	P1165	URETHANE FOAM PIPE BENDS #105	5			08Feb91	14Feb91	08Feb91	14Feb91 0
P FS	NA11	DELIVER ELEC MATL 102/103	40			12Sep89	L06Nov89	24Aug90	19Oct90 239
*****	226	CATHODIC PROTECTION AT TGE	*	15	*	07Nov89	29Nov89	27Feb91	19Mar91 *
S FS	890	WHC CATH. PROT. ATP, #101, #102 & TGE	5			28Sep90	04Oct90	20Mar91	26Mar91 117
P FS	NA11	DELIVER ELEC MATL 102/103	40			12Sep89	L06Nov89	24Aug90	19Oct90 239
*****	2265	CATHODIC PROTECTION FOR PIPE TO #101	*	15	*	07Nov89	29Nov89	27Feb91	19Mar91 *
S FS	890	WHC CATH. PROT. ATP, #101, #102 & TGE	5			28Sep90	04Oct90	20Mar91	26Mar91 117
P FS	A01	PENETRATIONS IN ROOF PANELS #102	10			28Aug90	L11Sep90	07Feb91	21Feb91 111
*****	230	INSTL INSTRUMENTATION 102	*	10	*	12Sep90	25Sep90	22Feb91	07Mar91 *
S FS	991	DELIVER 3A DOCUMENTS 102	*	10	*	01Dec90	01Dec90	08Mar91	08Mar91 97
P FS	A015	PENETRATIONS IN ROOF PANELS #104	10			15Nov90	L30Nov90	07Feb91	21Feb91 55
*****	2305	INSTL INSTRUMENTATION 104	*	10	*	03Dec90	14Dec90	22Feb91	07Mar91 *
S FS	995	DELIVER 3A DOCUMENTS 104/105	*	10	*	22Feb91	22Feb91	08Mar91	08Mar91 14
P FS	A11	PENETRATIONS IN ROOF PANELS #103	10			01Nov90	L14Nov90	07Feb91	21Feb91 65
*****	231	INSTL INSTRUMENTATION 103	*	10	*	15Nov90	30Nov90	22Feb91	07Mar91 *
S FS	991	DELIVER 3A DOCUMENTS 102	*	10	*	01Dec90	01Dec90	08Mar91	08Mar91 97
P FS	A115	PENETRATIONS IN ROOF PANELS #105	10			15Nov90	L30Nov90	07Feb91	21Feb91 55
*****	2315	INSTL INSTRUMENTATION 105	*	10	*	03Dec90	14Dec90	22Feb91	07Mar91 *
S FS	995	DELIVER 3A DOCUMENTS 104/105	*	10	*	22Feb91	22Feb91	08Mar91	08Mar91 14
P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85			10Apr89	L09Aug89	10Apr89	09Aug89 0
*****	240	WHC FAB LCH INSTR. ASSYS 102/103	*	100	*	E02Apr90	22Aug90	11Oct90	07Mar91 *
S FS	264	WHC INSTR TREE/PMP LEACHATE TK #102	2			07Sep90	10Sep90	08Mar91	11Mar91 124
S FS	266	WHC INSTR TREE/PMP LEACHATE TK #103	2			12Nov90	13Nov90	22Mar91	25Mar91 88

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GROUT VAULT PAIRS 102/103 & 104/105
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 NUMBER

P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	2405		WHC FAB LCH INSTR. ASSYS 104/105	*	100	* E04Sep90	28Jan91	25Oct90	21Mar91 *	37
S	FS	2645	WHC INSTR TREE/PMP LEACHATE TK #104		2	29Jan91	30Jan91	22Mar91	25Mar91	37
S	FS	2665	WHC INSTR TREE/PMP LEACHATE TK #105		2	29Jan91	30Jan91	05Apr91	08Apr91	47
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	244		WHC FAB PMP ASS & PRCH PMP 102/103	*	100	* E02Apr90	22Aug90	08Oct90	04Mar91 *	131
S	FS	264	WHC INSTR TREE/PMP LEACHATE TK #102		2	07Sep90	10Sep90	08Mar91	11Mar91	124
S	FS	266	WHC INSTR TREE/PMP LEACHATE TK #103		2	12Nov90	13Nov90	22Mar91	25Mar91	88
S	FS	274	WHC INSTL PUMP IN VALVE PIT #102		1	15Nov90	15Nov90	05Mar91	05Mar91	72
S	FS	276	WHC INSTL PUMP IN VALVE PIT #103		1	25Jan91	25Jan91	19Mar91	19Mar91	36
S	FS	286	WHC / PMP IN EXCESS WATER PITS #102		1	15Nov90	15Nov90	08Mar91	08Mar91	75
S	FS	288	WHC / PMP IN EXCESS WATER PITS #103		1	25Jan91	25Jan91	22Mar91	22Mar91	39
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	2445		WHC FAB PMP ASS & PRCH PMP 104/105	*	100	* E02Apr90	22Aug90	22Oct90	18Mar91 *	141
S	FS	2645	WHC INSTR TREE/PMP LEACHATE TK #104		2	29Jan91	30Jan91	22Mar91	25Mar91	37
S	FS	2665	WHC INSTR TREE/PMP LEACHATE TK #105		2	29Jan91	30Jan91	05Apr91	08Apr91	47
S	FS	2745	WHC INSTL PUMP IN VALVE PIT #104		1	08Feb91	08Feb91	19Mar91	19Mar91	26
S	FS	2765	WHC INSTL PUMP IN VALVE PIT #105		1	08Feb91	08Feb91	02Apr91	02Apr91	36
S	FS	2865	WHC / PMP IN EXCESS WATER PITS #104		1	08Feb91	08Feb91	22Mar91	22Mar91	29
S	FS	2885	WHC / PMP IN EXCESS WATER PITS #105		1	08Feb91	08Feb91	05Apr91	05Apr91	39
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	250		KEH FAB JUMPERS/LEACHATE PIT 102/103	*	60	* E02Apr90	25Jun90	12Dec90	11Mar91 *	176
S	FS	268	WHC INSTL JUMPER LEACHATE PITS #102		1	11Sep90	11Sep90	12Mar91	12Mar91	124
S	FS	270	WHC INSTL JUMPER LEACHATE PITS #103		1	14Nov90	14Nov90	26Mar91	26Mar91	88
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	2505		KEH FAB JUMPERS/LEACHATE PIT 104/105	*	60	* E02Apr90	25Jun90	28Dec90	25Mar91 *	186
S	FS	2685	WHC INSTL JUMPER LEACHATE PITS #104		1	31Jan91	31Jan91	26Mar91	26Mar91	37
S	FS	2705	WHC INSTL JUMPER LEACHATE PITS #105		1	31Jan91	31Jan91	09Apr91	09Apr91	47
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	252		KEH FAB JUMPERS/EXC WTR PIT 102/103	*	60	* E02Apr90	25Jun90	11Dec90	08Mar91 *	175
S	FS	290	WHC INSTL JUMPERS EXC WTR PITS 102		2	16Nov90	19Nov90	11Mar91	12Mar91	75
S	FS	292	WHC INSTL JUMPERS EXC WTR PITS 103		2	28Jan91	29Jan91	25Mar91	26Mar91	39
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	2525		KEH FAB JUMPERS/EXC WTR PIT 104/105	*	60	* E02Apr90	25Jun90	27Dec90	22Mar91 *	185
S	FS	2905	WHC INSTL JUMPERS EXC WTR PITS 104		2	11Feb91	12Feb91	25Mar91	26Mar91	29
S	FS	2925	WHC INSTL JUMPERS EXC WTR PITS 105		2	11Feb91	12Feb91	08Apr91	09Apr91	39

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CT REL LAG	ACTIVITY NUMBER	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT
P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	254	WHC MODIFY JUMPER FOR V PITS 102/103	*	20	* E02Apr90	27Apr90	05Feb91	05Mar91 * 212
S FS	278	WHC INSTL JUMPERS VALVE PIT #102	5	16Nov90	26Nov90	06Mar91	12Mar91	72
S FS	280	WHC INSTL JUMPERS VALVE PIT #103	5	28Jan91	01Feb91	20Mar91	26Mar91	36
S FS	281	WHC BURY CONTAMINATED MATLS 102/103	1	30Apr90	30Apr90	12Mar91	12Mar91	216
P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85	10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	2545	WHC MODIFY JUMPER FOR V PITS 104/105	*	20	* E02Apr90	27Apr90	20Feb91	19Mar91 * 222
S FS	2785	WHC INSTL JUMPERS VALVE PIT #104	5	11Feb91	15Feb91	20Mar91	26Mar91	26
S FS	2805	WHC INSTL JUMPERS VALVE PIT #105	5	11Feb91	15Feb91	03Apr91	09Apr91	36
S FS	2815	WHC BURY CONTAMINATED MATLS 104/105	1	30Apr90	30Apr90	26Mar91	26Mar91	226
P FS	220	RUN PIPE LINES TO VALVE PIT #102	20	18Oct90	L14Nov90	18Oct90	14Nov90	0
P FS	P115	URETHANE FOAM PIPE BENDS #102	5	15Nov90	21Nov90	15Nov90	21Nov90	0
*****	260	BERM 3' BKFL OVER NEW PIPELINES #102	*	4	* 26Nov90	29Nov90	26Nov90	29Nov90 * 0
S FS	900	WHC OTP #102	10	30Nov90	13Dec90	13Mar91	26Mar91	69
S FS	991	DELIVER 3A DOCUMENTS 102		01Dec90	01Dec90	08Mar91	08Mar91	97
S FS	W02	WEATHER DELAY TIME #102	10	30Nov90	13Dec90	30Nov90	13Dec90	0
P FS	2205	RUN PIPE LINES TO VALVE PIT #104	20	11Jan91	L07Feb91	11Jan91	07Feb91	0
P FS	P1155	URETHANE FOAM PIPE BENDS #104	5	08Feb91	14Feb91	08Feb91	14Feb91	0
*****	2605	BERM 3' BKFL OVER NEW PIPELINES #104	*	4	* 15Feb91	21Feb91	15Feb91	21Feb91 * 0
S FS	9005	WHC OTP #104	10	22Feb91	07Mar91	27Mar91	09Apr91	23
S FS	995	DELIVER 3A DOCUMENTS 104/105		22Feb91	22Feb91	08Mar91	08Mar91	14
S FS	W04	WEATHER DELAY TIME #104	10	22Feb91	07Mar91	22Feb91	07Mar91	0
P FS	224	RUN PIPE LINES TO VALVE PIT #103	20	27Dec90	L24Jan91	11Jan91	07Feb91	10
P FS	P116	URETHANE FOAM PIPE BENDS #103	5	25Jan91	31Jan91	08Feb91	14Feb91	10
*****	261	BERM 3' BKFL OVER NEW PIPELINES #103	*	4	* 01Feb91	06Feb91	15Feb91	21Feb91 * 10
S FS	901	WHC OTP #103	10	07Feb91	21Feb91	27Mar91	09Apr91	33
S FS	992	DELIVER 3A DOCUMENTS 103		07Feb91	07Feb91	08Mar91	08Mar91	29
S FS	W03	WEATHER DELAY TIME #103	10	07Feb91	21Feb91	22Feb91	07Mar91	10
P FS	2245	RUN PIPE LINES TO VALVE PIT #105	20	11Jan91	L07Feb91	11Jan91	07Feb91	0
P FS	P1165	URETHANE FOAM PIPE BENDS #105	5	08Feb91	14Feb91	08Feb91	14Feb91	0
*****	2615	BERM 3' BKFL OVER NEW PIPELINES #105	*	4	* 15Feb91	21Feb91	15Feb91	21Feb91 * 0
S FS	9015	WHC OTP #105	10	22Feb91	07Mar91	10Apr91	23Apr91	33
S FS	995	DELIVER 3A DOCUMENTS 104/105		22Feb91	22Feb91	08Mar91	08Mar91	14
S FS	W05	WEATHER DELAY TIME #105	10	22Feb91	07Mar91	22Feb91	07Mar91	0

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CT REL LAG	ACTIVITY NUMBER	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT

P	FS	210	BKFL 3' OVER ROOF CAP VAULT #102	4	09Oct90	L12Oct90	09Oct90	12Oct90	0
*****	*****	262	EXCAVATE FOR PIPE OVER #102	*	3	* 15Oct90	17Oct90	15Oct90	17Oct90 *
S	FS	220	RUN PIPE LINES TO VALVE PIT #102	20		18Oct90	14Nov90	18Oct90	14Nov90 0
P	FS	2105	BKFL 3' OVER ROOF CAP VAULT #104	4	02Jan91	L07Jan91	02Jan91	07Jan91	0
*****	*****	2625	EXCAVATE FOR PIPE OVER #104	*	3	* 08Jan91	10Jan91	08Jan91	10Jan91 *
S	FS	2205	RUN PIPE LINES TO VALVE PIT #104	20		11Jan91	07Feb91	11Jan91	07Feb91 0
P	FS	211	BKFL 3' OVER ROOF CAP VAULT #103	4	14Dec90	L19Dec90	14Dec90	19Dec90	0
*****	*****	263	EXCAVATE FOR PIPE OVER #103	*	3	* 20Dec90	26Dec90	08Jan91	10Jan91 *
S	FS	224	RUN PIPE LINES TO VALVE PIT #103	20		27Dec90	24Jan91	11Jan91	07Feb91 10
P	FS	2115	BKFL 3' OVER ROOF CAP VAULT #105	4	02Jan91	L07Jan91	02Jan91	07Jan91	0
*****	*****	2635	EXCAVATE FOR PIPE OVER #105	*	3	* 08Jan91	10Jan91	08Jan91	10Jan91 *
S	FS	2245	RUN PIPE LINES TO VALVE PIT #105	20		11Jan91	07Feb91	11Jan91	07Feb91 0
P	FS	178	FR & P LEACHATE PIT #102	7	28Aug90	L06Sep90	28Sep90	08Oct90	22
P	FS	240	WHC FAB LCH INSTR. ASSYs 102/103	100		02Apr90	22Aug90	11Oct90	07Mar91 134
P	FS	244	WHC FAB PMP ASS & PRCH PMP 102/103	100		02Apr90	22Aug90	08Oct90	04Mar91 131
*****	*****	264	WHC INSTR TREE/PMP LEACHATE TK #102	*	2	* 07Sep90	10Sep90	08Mar91	11Mar91 *
S	FS	268	WHC INSTL JUMPER LEACHATE PITS #102	1		11Sep90	11Sep90	12Mar91	12Mar91 124
P	FS	1785	FR & P LEACHATE PIT #104	7	15Nov90	L27Nov90	19Dec90	31Dec90	22
P	FS	2405	WHC FAB LCH INSTR. ASSYs 104/105	100		04Sep90	28Jan91	25Oct90	21Mar91 37
P	FS	2445	WHC FAB PMP ASS & PRCH PMP 104/105	100		02Apr90	22Aug90	22Oct90	18Mar91 141
*****	*****	2645	WHC INSTR TREE/PMP LEACHATE TK #104	*	2	* 29Jan91	30Jan91	22Mar91	25Mar91 *
S	FS	2685	WHC INSTL JUMPER LEACHATE PITS #104	1		31Jan91	31Jan91	26Mar91	26Mar91 37
P	FS	180	FR & P LEACHATE PIT #103	7	01Nov90	L09Nov90	05Dec90	13Dec90	22
P	FS	240	WHC FAB LCH INSTR. ASSYs 102/103	100		02Apr90	22Aug90	11Oct90	07Mar91 134
P	FS	244	WHC FAB PMP ASS & PRCH PMP 102/103	100		02Apr90	22Aug90	08Oct90	04Mar91 131
*****	*****	266	WHC INSTR TREE/PMP LEACHATE TK #103	*	2	* 12Nov90	13Nov90	22Mar91	25Mar91 *
S	FS	270	WHC INSTL JUMPER LEACHATE PITS #103	1		14Nov90	14Nov90	26Mar91	26Mar91 88
P	FS	1805	FR & P LEACHATE PIT #105	7	15Nov90	L27Nov90	19Dec90	31Dec90	22
P	FS	2405	WHC FAB LCH INSTR. ASSYs 104/105	100		04Sep90	28Jan91	25Oct90	21Mar91 37
P	FS	2445	WHC FAB PMP ASS & PRCH PMP 104/105	100		02Apr90	22Aug90	22Oct90	18Mar91 141
*****	*****	2665	WHC INSTR TREE/PMP LEACHATE TK #105	*	2	* 29Jan91	30Jan91	05Apr91	08Apr91 *
S	FS	2705	WHC INSTL JUMPER LEACHATE PITS #105	1		31Jan91	31Jan91	09Apr91	09Apr91 47

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL	
			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
P	FS		250	KEH FAB JUMPERS/LEACHATE PIT 102/103	60		02Apr90	L25Jun90	12Dec90	11Mar91	176
P	FS		264	WHC INSTR TREE/PMP LEACHATE TK #102	2		07Sep90	10Sep90	08Mar91	11Mar91	124
P	FS		282	WHC FURN NOZZLES,PLATES & CONN 102/103	40		01Jun89	28Jul89	13Apr90	08Jun90	217
*****	*****	*****	268	WHC INSTL JUMPER LEACHATE PITS #102	*	1	*	11Sep90	11Sep90	12Mar91	12Mar91 * 124
S	FS		900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91	26Mar91 69
P	FS		2505	KEH FAB JUMPERS/LEACHATE PIT 104/105	60		02Apr90	L25Jun90	28Dec90	25Mar91	186
P	FS		2645	WHC INSTR TREE/PMP LEACHATE TK #104	2		29Jan91	30Jan91	22Mar91	25Mar91	37
P	FS		2825	WHC FURN NOZZLES,PLATES & CONN 104/105	40		01Jun89	28Jul89	05Jul90	29Aug90	273
*****	*****	*****	2685	WHC INSTL JUMPER LEACHATE PITS #104	*	1	*	31Jan91	31Jan91	26Mar91	26Mar91 * 37
S	FS		9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91	09Apr91 23
P	FS		250	KEH FAB JUMPERS/LEACHATE PIT 102/103	60		02Apr90	L25Jun90	12Dec90	11Mar91	176
P	FS		266	WHC INSTR TREE/PMP LEACHATE TK #103	2		12Nov90	13Nov90	22Mar91	25Mar91	88
P	FS		282	WHC FURN NOZZLES,PLATES & CONN 102/103	40		01Jun89	28Jul89	13Apr90	08Jun90	217
*****	*****	*****	270	WHC INSTL JUMPER LEACHATE PITS #103	*	1	*	14Nov90	14Nov90	26Mar91	26Mar91 * 88
S	FS		901	WHC OTP #103		10		07Feb91	21Feb91	27Mar91	09Apr91 33
P	FS		2505	KEH FAB JUMPERS/LEACHATE PIT 104/105	60		02Apr90	L25Jun90	28Dec90	25Mar91	186
P	FS		2665	WHC INSTR TREE/PMP LEACHATE TK #105	2		29Jan91	30Jan91	05Apr91	08Apr91	47
P	FS		2825	WHC FURN NOZZLES,PLATES & CONN 104/105	40		01Jun89	28Jul89	05Jul90	29Aug90	273
*****	*****	*****	2705	WHC INSTL JUMPER LEACHATE PITS #105	*	1	*	31Jan91	31Jan91	09Apr91	09Apr91 * 47
S	FS		9015	WHC OTP #105		10		22Feb91	07Mar91	10Apr91	23Apr91 33
P	FS		220	RUN PIPE LINES TO VALVE PIT #102	20		18Oct90	L14Nov90	18Oct90	14Nov90	0
P	FS		244	WHC FAB PMP ASS & PRCH PMP 102/103	100		02Apr90	22Aug90	08Oct90	04Mar91	131
*****	*****	*****	274	WHC INSTL PUMP IN VALVE PIT #102	*	1	*	15Nov90	15Nov90	05Mar91	05Mar91 * 72
S	FS		278	WHC INSTL JUMPERS VALVE PIT #102		5		16Nov90	26Nov90	06Mar91	12Mar91 72
P	FS		2205	RUN PIPE LINES TO VALVE PIT #104	20		11Jan91	L07Feb91	11Jan91	07Feb91	0
P	FS		2445	WHC FAB PMP ASS & PRCH PMP 104/105	100		02Apr90	22Aug90	22Oct90	18Mar91	141
*****	*****	*****	2745	WHC INSTL PUMP IN VALVE PIT #104	*	1	*	08Feb91	08Feb91	19Mar91	19Mar91 * 26
S	FS		2785	WHC INSTL JUMPERS VALVE PIT #104		5		11Feb91	15Feb91	20Mar91	26Mar91 26
P	FS		224	RUN PIPE LINES TO VALVE PIT #103	20		27Dec90	L24Jan91	11Jan91	07Feb91	10
P	FS		244	WHC FAB PMP ASS & PRCH PMP 102/103	100		02Apr90	22Aug90	08Oct90	04Mar91	131
*****	*****	*****	276	WHC INSTL PUMP IN VALVE PIT #103	*	1	*	25Jan91	25Jan91	19Mar91	19Mar91 * 36
S	FS		280	WHC INSTL JUMPERS VALVE PIT #103		5		28Jan91	01Feb91	20Mar91	26Mar91 36

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N E T W O R K L O G I C

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL	
			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
P	FS	2245	RUN PIPE LINES TO VALVE PIT #105		20		11Jan91	07Feb91	11Jan91	07Feb91	0
P	FS	2445	WHC FAB PMP ASS & PRCH PMP 104/105		100		02Apr90	22Aug90	22Oct90	18Mar91	141
*****	*****	2765	WHC INSTL PUMP IN VALVE PIT #105	*	1	*	08Feb91	08Feb91	02Apr91	02Apr91	* 36
S	FS	2805	WHC INSTL JUMPERS VALVE PIT #105		5		11Feb91	15Feb91	03Apr91	09Apr91	36
P	FS	254	WHC MODIFY JUMPER FOR V PITS 102/103		20		02Apr90	L27Apr90	05Feb91	05Mar91	212
P	FS	274	WHC INSTL PUMP IN VALVE PIT #102		1		15Nov90	15Nov90	05Mar91	05Mar91	72
*****	*****	278	WHC INSTL JUMPERS VALVE PIT #102	*	5	*	16Nov90	26Nov90	06Mar91	12Mar91	* 72
S	FS	900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91	26Mar91	69
P	FS	2545	WHC MODIFY JUMPER FOR V PITS 104/105		20		02Apr90	L27Apr90	20Feb91	19Mar91	222
P	FS	2745	WHC INSTL PUMP IN VALVE PIT #104		1		08Feb91	08Feb91	19Mar91	19Mar91	26
*****	*****	2785	WHC INSTL JUMPERS VALVE PIT #104	*	5	*	11Feb91	15Feb91	20Mar91	26Mar91	* 26
S	FS	9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91	09Apr91	23
P	FS	254	WHC MODIFY JUMPER FOR V PITS 102/103		20		02Apr90	L27Apr90	05Feb91	05Mar91	212
P	FS	276	WHC INSTL PUMP IN VALVE PIT #103		1		25Jan91	25Jan91	19Mar91	19Mar91	36
*****	*****	280	WHC INSTL JUMPERS VALVE PIT #103	*	5	*	28Jan91	01Feb91	20Mar91	26Mar91	* 36
S	FS	901	WHC OTP #103		10		07Feb91	21Feb91	27Mar91	09Apr91	33
P	FS	2545	WHC MODIFY JUMPER FOR V PITS 104/105		20		02Apr90	L27Apr90	20Feb91	19Mar91	222
P	FS	2765	WHC INSTL PUMP IN VALVE PIT #105		1		08Feb91	08Feb91	02Apr91	02Apr91	36
*****	*****	2805	WHC INSTL JUMPERS VALVE PIT #105	*	5	*	11Feb91	15Feb91	03Apr91	09Apr91	* 36
S	FS	9015	WHC OTP #105		10		22Feb91	07Mar91	10Apr91	23Apr91	33
P	FS	254	WHC MODIFY JUMPER FOR V PITS 102/103		20		02Apr90	L27Apr90	05Feb91	05Mar91	212
*****	*****	281	WHC BURY CONTAMINATED MATLS 102/103	*	1	*	30Apr90	30Apr90	12Mar91	12Mar91	* 216
S	FS	900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91	26Mar91	69
S	FS	901	WHC OTP #103		10		07Feb91	21Feb91	27Mar91	09Apr91	33
P	FS	2545	WHC MODIFY JUMPER FOR V PITS 104/105		20		02Apr90	L27Apr90	20Feb91	19Mar91	222
*****	*****	2815	WHC BURY CONTAMINATED MATLS 104/105	*	1	*	30Apr90	30Apr90	26Mar91	26Mar91	* 226
S	FS	9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91	09Apr91	23
S	FS	9015	WHC OTP #105		10		22Feb91	07Mar91	10Apr91	23Apr91	33
P	FS	008	START PROJECT CONSTRUCTION				01Oct88	L01Oct88	03Oct88	03Oct88	
*****	*****	282	WHC FURN NOZZLES,PLATES & CONN 102/103	*	40	*	E01Jun89	28Jul89	13Apr90	08Jun90	* 217
S	FS	215	PREFAB PIPELINES 102/103		75		12Sep89	29Dec89	11Jun90	26Sep90	187
S	FS	268	WHC INSTL JUMPER LEACHATE PITS #102		1		11Sep90	11Sep90	12Mar91	12Mar91	124
S	FS	270	WHC INSTL JUMPER LEACHATE PITS #103		1		14Nov90	14Nov90	26Mar91	26Mar91	88

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P FS	008	START PROJECT CONSTRUCTION		01Oct88	L01Oct88	03Oct88	03Oct88	2
*****	2825	WHC FURN NOZZLES,PLATES & CONN 104/105	*	40	* E01Jun89	28Jul89	05Jul90	29Aug90 *
S FS	2155	PREFAB PIPELINES 104/105		75		14Nov89	06Mar90	17Dec90 273
S FS	2685	WHC INSTL JUMPER LEACHATE PITS #104		1		31Jan91	31Jan91	26Mar91 198
S FS	2705	WHC INSTL JUMPER LEACHATE PITS #105		1		31Jan91	31Jan91	26Mar91 37
P FS	008	START PROJECT CONSTRUCTION		01Oct88	L01Oct88	03Oct88	03Oct88	2
P FS	402	MISC ELEC NOT IN EXCAV AREA 102/103	*	60		07Nov89	05Feb90	22Oct90 239
*****	283	WHC TIE-IN 15KV OVERHEAD LINES	*	1		* 06Feb90	06Feb90	21Jan91 21Jan91 *
S FS	404	INSTALL ELECTRICAL #102		30		14Aug90	25Sep90	22Jan91 05Mar91 109
P FS	220	RUN PIPE LINES TO VALVE PIT #102		20		18Oct90	L14Nov90	18Oct90 14Nov90 0
P FS	244	WHC FAB PMP ASS & PRCH PMP 102/103		100		02Apr90	22Aug90	08Oct90 04Mar91 131
*****	286	WHC / PMP IN EXCESS WATER PITS #102	*	1		* 15Nov90	15Nov90	08Mar91 08Mar91 * 75
S FS	290	WHC INSTL JUMPERS EXC WTR PITS 102		2		16Nov90	19Nov90	11Mar91 12Mar91 75
P FS	2205	RUN PIPE LINES TO VALVE PIT #104		20		11Jan91	L07Feb91	11Jan91 07Feb91 0
P FS	2445	WHC FAB PMP ASS & PRCH PMP 104/105	*	100		02Apr90	22Aug90	22Oct90 18Mar91 141
*****	2865	WHC / PMP IN EXCESS WATER PITS #104	*	1		* 08Feb91	08Feb91	22Mar91 22Mar91 * 29
S FS	2905	WHC INSTL JUMPERS EXC WTR PITS 104		2		11Feb91	12Feb91	25Mar91 26Mar91 29
P FS	224	RUN PIPE LINES TO VALVE PIT #103		20		27Dec90	L24Jan91	11Jan91 07Feb91 10
P FS	244	WHC FAB PMP ASS & PRCH PMP 102/103	*	100		02Apr90	22Aug90	08Oct90 04Mar91 131
*****	288	WHC / PMP IN EXCESS WATER PITS #103	*	1		* 25Jan91	25Jan91	22Mar91 22Mar91 * 39
S FS	292	WHC INSTL JUMPERS EXC WTR PITS 103		2		28Jan91	29Jan91	25Mar91 26Mar91 39
P FS	2245	RUN PIPE LINES TO VALVE PIT #105		20		11Jan91	L07Feb91	11Jan91 07Feb91 0
P FS	2445	WHC FAB PMP ASS & PRCH PMP 104/105	*	100		02Apr90	22Aug90	22Oct90 18Mar91 141
*****	2885	WHC / PMP IN EXCESS WATER PITS #105	*	1		* 08Feb91	08Feb91	05Apr91 05Apr91 * 39
S FS	2925	WHC INSTL JUMPERS EXC WTR PITS 105		2		11Feb91	12Feb91	08Apr91 09Apr91 39
P FS	252	KEH FAB JUMPERS/EXC WTR PIT 102/103		60		02Apr90	L25Jun90	11Dec90 08Mar91 175
P FS	286	WHC / PMP IN EXCESS WATER PITS #102	*	1		15Nov90	15Nov90	08Mar91 08Mar91 75
*****	290	WHC INSTL JUMPERS EXC WTR PITS 102	*	2		* 16Nov90	19Nov90	11Mar91 12Mar91 * 75
S FS	900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91 26Mar91 69
P FS	2525	KEH FAB JUMPERS/EXC WTR PIT 104/105		60		02Apr90	L25Jun90	27Dec90 22Mar91 185
P FS	2865	WHC / PMP IN EXCESS WATER PITS #104	*	1		08Feb91	08Feb91	22Mar91 22Mar91 29
*****	2905	WHC INSTL JUMPERS EXC WTR PITS 104	*	2		* 11Feb91	12Feb91	25Mar91 26Mar91 * 29
S FS	9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91 09Apr91 23

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
					TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS	252	KEH FAB JUMPERS/EXC WTR PIT	102/103	60		02Apr90	L25Jun90	11Dec90	08Mar91	175	
P	FS	288	WHC / PMP IN EXCESS WATER PITS #103		1		25Jan91	25Jan91	22Mar91	22Mar91	39	
*****	*****	292	WHC INSTL JUMPERS EXC WTR PITS 103		*	2	*	28Jan91	29Jan91	25Mar91	26Mar91 *	39
S	FS	901	WHC OTP #103		10		07Feb91	21Feb91	27Mar91	09Apr91	33	
P	FS	2525	KEH FAB JUMPERS/EXC WTR PIT	104/105	60		02Apr90	L25Jun90	27Dec90	22Mar91	185	
P	FS	2885	WHC / PMP IN EXCESS WATER PITS #105		1		08Feb91	08Feb91	05Apr91	05Apr91	39	
*****	*****	2925	WHC INSTL JUMPERS EXC WTR PITS 105		*	2	*	11Feb91	12Feb91	08Apr91	09Apr91 *	39
S	FS	9015	WHC OTP #105		10		22Feb91	07Mar91	10Apr91	23Apr91	33	
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT		85		10Apr89	L09Aug89	10Apr89	09Aug89	0	
*****	*****	400	ELEC SUBMITTALS 16300, 16400 & 16640		*	22	*	10Aug89	11Sep89	25Jul90	23Aug90 *	239
S	FS	NA11	DELIVER ELEC MATL 102/103		40		12Sep89	06Nov89	24Aug90	19Oct90	239	
P	FS	NA11	DELIVER ELEC MATL 102/103		40		12Sep89	L06Nov89	24Aug90	19Oct90	239	
*****	*****	402	MISC ELEC NOT IN EXCAV AREA 102/103		*	60	*	07Nov89	05Feb90	22Oct90	18Jan91 *	239
S	FS	283	WHC TIE-IN 15KV OVERHEAD LINES		1		06Feb90	06Feb90	21Jan91	21Jan91	239	
S	FS	404	INSTALL ELECTRICAL #102		30		14Aug90	25Sep90	22Jan91	05Mar91	109	
S	FS	405	INSTALL ELECTRICAL #103 & #104		30		01Nov90	14Dec90	05Feb91	19Mar91	63	
P	FS	112	BKFL TO TOP OF WALLS VAULT #102		10		31Jul90	L13Aug90	31Jul90	13Aug90	0	
P	FS	283	WHC TIE-IN 15KV OVERHEAD LINES		1		06Feb90	06Feb90	21Jan91	21Jan91	239	
P	FS	402	MISC ELEC NOT IN EXCAV AREA 102/103		60		07Nov89	05Feb90	22Oct90	18Jan91	239	
P	FS	NA11	DELIVER ELEC MATL 102/103		40		12Sep89	06Nov89	24Aug90	19Oct90	239	
*****	*****	404	INSTALL ELECTRICAL #102		*	30	*	14Aug90	25Sep90	22Jan91	05Mar91 *	109
S	FS	880	WHC ELEC. TIE-IN TO EXISTING #102		5		26Sep90	02Oct90	06Mar91	12Mar91	109	
P	FS	1125	BKFL TO TOP OF WALLS VAULT #104		10		18Oct90	L31Oct90	18Oct90	31Oct90	0	
P	FS	113	BKFL TO TOP OF WALLS VAULT #103		10		04Oct90	17Oct90	04Oct90	17Oct90	0	
P	FS	402	MISC ELEC NOT IN EXCAV AREA 102/103		60		07Nov89	05Feb90	22Oct90	18Jan91	239	
P	FS	NA11	DELIVER ELEC MATL 102/103		40		12Sep89	06Nov89	24Aug90	19Oct90	239	
*****	*****	405	INSTALL ELECTRICAL #103 & #104		*	30	*	01Nov90	14Dec90	05Feb91	19Mar91 *	63
S	FS	881	WHC ELEC TIE-INS TO EXISTING #103		5		17Dec90	21Dec90	20Mar91	26Mar91	63	
P	FS	1135	BKFL TO TOP OF WALLS VAULT #105		10		18Oct90	L31Oct90	18Oct90	31Oct90	0	
P	FS	NA115	DELIVER ELEC MATL 104/105		40		14Nov89	15Jan90	20Dec90	19Feb91	275	
*****	*****	4055	INSTALL ELECTRICAL #105		*	30	*	01Nov90	14Dec90	20Feb91	02Apr91 *	73
S	FS	8815	WHC ELEC TIE-INS TO EXISTING #105		5		17Dec90	21Dec90	03Apr91	09Apr91	73	

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P	FS	P108	FAB PIT COVER BLOCKS #102	30	12Sep89	L23Oct89	15Oct90	27Nov90	274	
P	FS	P117	PAINT & ID MARKINGS #102	5	19Sep90	25Sep90	02Oct90	08Oct90	9	
P	FS	P119	DRAIN SEAL ASSEMBLY #102	20	12Sep89	09Oct89	29Oct90	27Nov90	284	
*****	*****	410	INSTL PIT COVER BLOCKS 102	*	26Sep90	27Sep90	28Nov90	29Nov90	*	
S	FS	900	WHC OTP #102	10	30Nov90	13Dec90	13Mar91	26Mar91	69	
S	FS	991	DELIVER 3A DOCUMENTS 102		01Dec90	01Dec90	08Mar91	08Mar91	97	
S	FS	W02	WEATHER DELAY TIME #102	10	30Nov90	13Dec90	30Nov90	13Dec90	0	
P	FS	P1085	FAB PIT COVER BLOCKS #104	30	14Nov89	L29Dec89	08Jan91	19Feb91	285	
P	FS	P1175	PAINT & ID MARKINGS #104	5	10Dec90	14Dec90	21Dec90	31Dec90	9	
P	FS	P1195	DRAIN SEAL ASSEMBLY #104	20	14Nov89	13Dec89	22Jan91	19Feb91	295	
*****	*****	4105	INSTL PIT COVER BLOCKS 104	*	17Dec90	18Dec90	20Feb91	21Feb91	*	
S	FS	9005	WHC OTP #104	10	22Feb91	07Mar91	27Mar91	09Apr91	23	
S	FS	995	DELIVER 3A DOCUMENTS 104/105		22Feb91	22Feb91	08Mar91	08Mar91	14	
S	FS	W04	WEATHER DELAY TIME #104	10	22Feb91	07Mar91	22Feb91	07Mar91	0	
P	FS	P109	FAB PIT COVER BLOCKS #103	30	12Sep89	L23Oct89	08Jan91	19Feb91	330	
P	FS	P118	PAINT & ID MARKINGS #103	5	26Nov90	30Nov90	07Dec90	13Dec90	9	
P	FS	P120	DRAIN SEAL ASSEMBLY #103	20	12Sep89	09Oct89	22Jan91	19Feb91	340	
*****	*****	411	INSTL PIT COVER BLOCKS 103	*	03Dec90	04Dec90	20Feb91	21Feb91	*	
S	FS	901	WHC OTP #103	10	07Feb91	21Feb91	27Mar91	09Apr91	33	
S	FS	992	DELIVER 3A DOCUMENTS 103		07Feb91	07Feb91	08Mar91	08Mar91	29	
S	FS	W03	WEATHER DELAY TIME #103	10	07Feb91	21Feb91	22Feb91	07Mar91	10	
P	FS	P1095	FAB PIT COVER BLOCKS #105	30	14Nov89	L29Dec89	08Jan91	19Feb91	285	
P	FS	P1185	PAINT & ID MARKINGS #105	5	10Dec90	14Dec90	21Dec90	31Dec90	9	
P	FS	P1205	DRAIN SEAL ASSEMBLY #105	20	14Nov89	13Dec89	22Jan91	19Feb91	295	
*****	*****	4115	INSTL PIT COVER BLOCKS 105	*	17Dec90	18Dec90	20Feb91	21Feb91	*	
S	FS	9015	WHC OTP #105	10	22Feb91	07Mar91	10Apr91	23Apr91	33	
S	FS	995	DELIVER 3A DOCUMENTS 104/105		22Feb91	22Feb91	08Mar91	08Mar91	14	
S	FS	W05	WEATHER DELAY TIME #105	10	22Feb91	07Mar91	22Feb91	07Mar91	0	
*****	*****	501	3.1.20 WP 1A KEH MGMT (INDIRECTS)	*	250	* E20Jul89	L18Jul90	28Jul89	26Jul90	*
*****	*****	5015	3.1.20 WP 1A KEH MGMT (INDIRECTS)	*	250	* E23Oct89	L19Oct90	26Oct89	24Oct90	*
*****	*****	502	3.1.21 WP 1B KEH MGMT (INDIRECTS)	*	15	* E01May89	L19May89	01May89	19May89	*
*****	*****	5025	3.1.21 WP 1B KEH MGMT (INDIRECTS)	*	15	* E02Oct89	L20Oct89	02Oct89	20Oct89	*
*****	*****	503	3.1.22 WP 1C KEH-MGMT	*	80	* E03Oct88	L27Jan89	100ct88	03Feb89	*

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*****	504	3.2.2 WP 2 KEH-MGMT	*	150	* E01May89	L04Dec89	22May89	27Dec89 *	15
*****	5045	3.2.2 WP 2 KEH-MGMT	*	150	* E01Sep89	L09Apr90	06Sep89	11Apr90 *	2
*****	506	3.3.2 WP 3 KEH MGMT	*	450	* E01Feb89	L13Nov90	17Mar89	02Jan91 *	31
*****	5065	3.3.2 WP 3 KEH MGMT	*	500	* E01Feb89	L29Jan91	05Apr89	02Apr91 *	44
*****	507	3.5.2 WP 5 KEH MGMT	*	200	* E01Oct90	L18Jul91	13Nov90	30Aug91 *	31
*****	5075	3.5.2 WP 5 KEH MGMT	*	200	* E01Oct90	L18Jul91	13Nov90	30Aug91 *	31
*****	508	3.6.2 WP 6 KEH MGMT	*	120	* E01Nov90	L25Apr91	06Nov90	30Apr91 *	3
*****	5085	3.6.2 WP 6 KEH MGMT	*	100	* E02Jan90	L22May90	09Jan91	30May91 *	256
*****	509	3.7.2 WP 7 KEH MGMT	*	10	* E01Jul91	L16Jul91	19Aug91	30Aug91 *	33
*****	5095	3.7.2 WP 7 KEH MGMT	*	10	* E01Jul91	L16Jul91	19Aug91	30Aug91 *	33
*****	601	3.1.20 WP 1A ESCALATION	*	200	* E24Jan89	L06Nov89	09Oct89	26Jul90 *	179
*****	6015	3.1.20 WP 1A ESCALATION	*	200	* E23Oct89	L09Aug90	11Jan90	24Oct90 *	53
*****	602	3.1.21 WP 1B ESCALATION	*	15	* E03Jan89	L23Jan89	01May89	19May89 *	83
*****	6025	3.1.21 WP 1B ESCALATION	*	15	* E02Oct89	L20Oct89	02Oct89	20Oct89 *	0
*****	603	3.1.22 WP 1C ESCALATION	*	60	* E15Nov88	L13Feb89	01Dec88	28Feb89 *	10
*****	604	3.2.2 WP 2 ESCALATION	*	150	* E01May89	L04Dec89	22May89	27Dec89 *	15
*****	6045	3.2.2 WP 2 ESCALATION	*	150	* E01Sep89	L09Apr90	06Sep89	11Apr90 *	2
*****	605	3.3.1 WP 3 ESCALATION	*	10	* E15Aug90	L28Aug90	24Apr91	07May91 *	173
*****	606	3.3.2 WP 3 ESCALATION	*	450	* E01Feb89	L13Nov90	17Mar89	02Jan91 *	31
*****	6065	3.3.2 WP 3 ESCALATION	*	500	* E01Feb89	L29Jan91	05Apr89	02Apr91 *	44
*****	607	3.5.2 WP 5 ESCALATION	*	200	* E01Oct90	L18Jul91	13Nov90	30Aug91 *	31

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*****	6075	3.5.2 WP 5 ESCALATION	*	200	* E01Oct90 L18Jul91	13Nov90	30Aug91	*	31
*****	608	3.6.2 WP 6 ESCALATION	*	120	* E01Nov90 L25Apr91	06Nov90	30Apr91	*	3
*****	6085	3.6.2 WP 6 ESCALATION	*	100	* E02Jan91 L22May91	09Jan91	30May91	*	5
*****	609	3.7.2 WP 7 ESCALATION	*	10	* E01Jul91 L16Jul91	19Aug91	30Aug91	*	33
*****	6095	3.7.2 WP 7 ESCALATION	*	10	* E01Jul91 L16Jul91	19Aug91	30Aug91	*	33
*****	610	4.0 WHC PROJECT MGMT ESCALATION	*	600	* E01Sep88 L24Jan91	12Apr89	30Aug91	*	152
*****	611	3.3.3 WP 3 ESCALATION	*	1	* E09Oct89 L09Oct89	26Mar91	26Mar91	*	365
*****	612	1.1 ESCALATION	*	500	* E04Jan88 L28Dec89	05Jan88	29Dec89	*	1
*****	613	1.2 ESCALATION	*	650	* E01Dec88 L03Jul91	31Jan89	30Aug91	*	40
*****	701	3.1.20 WP 1A CONTINGENCY	*	200	* E24Jan89 L06Nov89	09Oct89	26Jul90	*	179
*****	7015	3.1.20 WP 1A CONTINGENCY	*	200	* E23Oct89 L09Aug90	11Jan90	24Oct90	*	53
*****	702	3.1.21 WP 1B CONTINGENCY	*	15	* E03Jan89 L23Jan89	01May89	19May89	*	83
*****	7025	3.1.21 WP 1B CONTINGENCY	*	15	* E02Oct89 L20Oct89	02Oct89	20Oct89	*	0
*****	703	3.1.22 WP 1C CONTINGENCY	*	60	* E15Nov88 L13Feb89	01Dec88	28Feb89	*	10
*****	704	3.2.2 WP 2 CONTINGENCY	*	150	* E01May89 L04Dec89	22May89	27Dec89	*	15
*****	7045	3.2.2 WP 2 CONTINGENCY	*	150	* E01Sep89 L09Apr90	06Sep89	11Apr90	*	2
*****	705	3.3.1 WP 3 CONTINGENCY	*	10	* E15Aug90 L28Aug90	24Apr91	07May91	*	173
*****	706	3.3.2 WP 3 CONTINGENCY	*	450	* E01Feb89 L13Nov90	17Mar89	02Jan91	*	31
*****	7065	3.3.2 WP 3 CONTINGENCY	*	500	* E01Feb89 L29Jan91	05Apr89	02Apr91	*	44
*****	707	3.5.2 WP 5 CONTINGENCY	*	200	* E01Oct90 L18Jul91	13Nov90	30Aug91	*	31
*****	7075	3.5.2 WP 5 CONTINGENCY	*	200	* E01Oct90 L18Jul91	13Nov90	30Aug91	*	31

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*****	708	3.6.2 WP 6 CONTINGENCY	*	120	*	E01Nov90	L25Apr91	06Nov90	30Apr91 *	3
*****	7085	3.6.2 WP 6 CONTINGENCY	*	100	*	E02Jan91	L22May91	09Jan91	30May91 *	5
*****	709	3.7.2 WP 7 CONTINGENCY	*	10	*	E01Jul91	L16Jul91	19Aug91	30Aug91 *	33
*****	7095	3.7.2 WP 7 CONTINGENCY	*	10	*	E01Jul91	L16Jul91	19Aug91	30Aug91 *	33
*****	710	4.0 WHC PROJECT MGMT CONTINGENCY	*	600	*	E01Sep88	L24Jan91	12Apr89	30Aug91 *	152
*****	711	3.3.3 WP 3 CONTINGENCY	*	1	*	E09Oct89	L09Oct89	26Mar91	26Mar91 *	365
*****	712	1.1 CONTINGENCY	*	500	*	E04Jan88	L28Dec89	05Jan88	29Dec89 *	1
*****	713	1.2 CONTINGENCY	*	650	*	E01Dec88	L03Jul91	31Jan89	30Aug91 *	40
P FS	404	INSTALL ELECTRICAL #102	*	30	*	14Aug90	L25Sep90	22Jan91	05Mar91	109
*****	880	WHC ELEC. TIE-IN TO EXISTING #102	*	5	*	26Sep90	02Oct90	06Mar91	12Mar91 *	109
S FS	900	WHC OTP #102	*	10	*	30Nov90	13Dec90	13Mar91	26Mar91	69
P FS	405	INSTALL ELECTRICAL #103 & #104	*	30	*	01Nov90	L14Dec90	05Feb91	19Mar91	63
*****	881	WHC ELEC TIE-INS TO EXISTING #103	*	5	*	17Dec90	21Dec90	20Mar91	26Mar91 *	63
S FS	901	WHC OTP #103	*	10	*	07Feb91	21Feb91	27Mar91	09Apr91	33
P FS	4055	INSTALL ELECTRICAL #105	*	30	*	01Nov90	L14Dec90	20Feb91	02Apr91	73
*****	8815	WHC ELEC TIE-INS TO EXISTING #105	*	5	*	17Dec90	21Dec90	03Apr91	09Apr91 *	73
S FS	9015	WHC OTP #105	*	10	*	22Feb91	07Mar91	10Apr91	23Apr91	33
P FS	222	CATHODIC PROTECTION FOR PIPE TO #102	*	15	*	07Sep90	L27Sep90	27Feb91	19Mar91	117
P FS	226	CATHODIC PROTECTION AT TGE	*	15	*	07Nov89	29Nov89	27Feb91	19Mar91	325
P FS	2265	CATHODIC PROTECTION FOR PIPE TO #101	*	15	*	07Nov89	29Nov89	27Feb91	19Mar91	325
*****	890	WHC CATH. PROT. ATP, #101, #102 & TGE	*	5	*	28Sep90	04Oct90	20Mar91	26Mar91 *	117
S FS	904	CF PIPE TIE-INS P/ TO GROUT PMP 102	*	10	*	14Dec90	31Dec90	27Mar91	09Apr91	69
P FS	2225	CATHODIC PROTECTION FOR PIPE TO #104	*	15	*	28Nov90	L18Dec90	13Mar91	02Apr91	71
*****	8905	WHC CATHODIC PROTECTION ATP #104	*	5	*	19Dec90	27Dec90	03Apr91	09Apr91 *	71
S FS	9045	CF PIPE TIE-INS P/ TO GROUT PMP 104	*	10	*	08Mar91	21Mar91	10Apr91	23Apr91	23

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CT REL LAG	ACTIVITY NUMBER	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT

P	FS	260	BERM 3' BKFL OVER NEW PIPELINES #102	4	26Nov90	L29Nov90	26Nov90	29Nov90	0
P	FS	268	WHC INSTL JUMPER LEACHATE PITS #102	1	11Sep90	11Sep90	12Mar91	12Mar91	124
P	FS	278	WHC INSTL JUMPERS VALVE PIT #102	5	16Nov90	26Nov90	06Mar91	12Mar91	72
P	FS	281	WHC BURY CONTAMINATED MATLS 102/103	1	30Apr90	30Apr90	12Mar91	12Mar91	216
P	FS	290	WHC INSTL JUMPERS EXC WTR PITS 102	2	16Nov90	19Nov90	11Mar91	12Mar91	75
P	FS	410	INSTL PIT COVER BLOCKS 102	2	26Sep90	27Sep90	28Nov90	29Nov90	43
P	FS	880	WHC ELEC. TIE-IN TO EXISTING #102	5	26Sep90	02Oct90	06Mar91	12Mar91	109
P	FS	907	DUST COVER OVER GRAVEL BARRIER #102	5	15Oct90	19Oct90	01Mar91	07Mar91	93
*****	*****	900	WHC OTP #102	*	30Nov90	13Dec90	13Mar91	26Mar91	*
S	FS	904	CF PIPE TIE-INS P/ TO GROUT PMP 102	10	14Dec90	31Dec90	27Mar91	09Apr91	69
P	FS	2605	BERM 3' BKFL OVER NEW PIPELINES #104	4	15Feb91	L21Feb91	15Feb91	21Feb91	0
P	FS	2685	WHC INSTL JUMPER LEACHATE PITS #104	1	31Jan91	31Jan91	26Mar91	26Mar91	37
P	FS	2785	WHC INSTL JUMPERS VALVE PIT #104	5	11Feb91	15Feb91	20Mar91	26Mar91	26
P	FS	2815	WHC BURY CONTAMINATED MATLS 104/105	1	30Apr90	30Apr90	26Mar91	26Mar91	226
P	FS	2905	WHC INSTL JUMPERS EXC WTR PITS 104	2	11Feb91	12Feb91	25Mar91	26Mar91	29
P	FS	4105	INSTL PIT COVER BLOCKS 104	2	17Dec90	18Dec90	20Feb91	21Feb91	43
P	FS	9075	DUST COVER OVER GRAVEL BARRIER #104	5	08Jan91	14Jan91	01Mar91	07Mar91	37
*****	*****	9005	WHC OTP #104	*	22Feb91	07Mar91	27Mar91	09Apr91	*
S	FS	9045	CF PIPE TIE-INS P/ TO GROUT PMP 104	10	08Mar91	21Mar91	10Apr91	23Apr91	23
P	FS	261	BERM 3' BKFL OVER NEW PIPELINES #103	4	01Feb91	L06Feb91	15Feb91	21Feb91	10
P	FS	270	WHC INSTL JUMPER LEACHATE PITS #103	1	14Nov90	14Nov90	26Mar91	26Mar91	88
P	FS	280	WHC INSTL JUMPERS VALVE PIT #103	5	28Jan91	01Feb91	20Mar91	26Mar91	36
P	FS	281	WHC BURY CONTAMINATED MATLS 102/103	1	30Apr90	30Apr90	12Mar91	12Mar91	216
P	FS	292	WHC INSTL JUMPERS EXC WTR PITS 103	2	28Jan91	29Jan91	25Mar91	26Mar91	39
P	FS	411	INSTL PIT COVER BLOCKS 103	2	03Dec90	04Dec90	20Feb91	21Feb91	53
P	FS	881	WHC ELEC TIE-INS TO EXISTING #103	5	17Dec90	21Dec90	20Mar91	26Mar91	63
P	FS	908	DUST COVER OVER GRAVEL BARRIER #103	5	20Dec90	28Dec90	01Mar91	07Mar91	47
*****	*****	901	WHC OTP #103	*	07Feb91	21Feb91	27Mar91	09Apr91	*
S	FS	905	CF PIPE TIE-INS P/ TO GROUT PMP 103	10	22Feb91	07Mar91	10Apr91	23Apr91	33
P	FS	2615	BERM 3' BKFL OVER NEW PIPELINES #105	4	15Feb91	L21Feb91	15Feb91	21Feb91	0
P	FS	2705	WHC INSTL JUMPER LEACHATE PITS #105	1	31Jan91	31Jan91	09Apr91	09Apr91	47
P	FS	2805	WHC INSTL JUMPERS VALVE PIT #105	5	11Feb91	15Feb91	03Apr91	09Apr91	36
P	FS	2815	WHC BURY CONTAMINATED MATLS 104/105	1	30Apr90	30Apr90	26Mar91	26Mar91	226
P	FS	2925	WHC INSTL JUMPERS EXC WTR PITS 105	2	11Feb91	12Feb91	08Apr91	09Apr91	39
P	FS	4115	INSTL PIT COVER BLOCKS 105	2	17Dec90	18Dec90	20Feb91	21Feb91	43
P	FS	8815	WHC ELEC TIE-INS TO EXISTING #105	5	17Dec90	21Dec90	03Apr91	09Apr91	73
P	FS	9085	DUST COVER OVER GRAVEL BARRIER #105	5	08Jan91	14Jan91	01Mar91	07Mar91	37
*****	*****	9015	WHC OTP #105	*	22Feb91	07Mar91	10Apr91	23Apr91	*
S	FS	9055	CF PIPE TIE-INS P/ TO GROUT PMP 105	10	08Mar91	21Mar91	24Apr91	07May91	33

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 CT REL LAG ACTIVITY DESCRIPTION DURATION EARLY TOTAL REM. EARLY START LATE TOTAL
 NUMBER

P	FS	890	WHC CATH. PROT. ATP, #101, #102 & TGE		5		28Sep90	L04Oct90	20Mar91	26Mar91	117
P	FS	900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91	26Mar91	69
*****	*****	904	CF PIPE TIE-INS P/ TO GROUT PMP 102	*	10	*	14Dec90	31Dec90	27Mar91	09Apr91	*
S	FS	930	WHC FILL VAULT #102 WITH WASTE GROUT		20		02Jan91	29Jan91	10Apr91	07May91	69
P	FS	8905	WHC CATHODIC PROTECTION ATP #104		5		19Dec90	L27Dec90	03Apr91	09Apr91	71
P	FS	9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91	09Apr91	23
*****	*****	9045	CF PIPE TIE-INS P/ TO GROUT PMP 104	*	10	*	08Mar91	21Mar91	10Apr91	23Apr91	*
S	FS	9305	WHC FILL VAULT #104 WITH WASTE GROUT		20		22Mar91	18Apr91	24Apr91	21May91	23
P	FS	901	WHC OTP #103		10		07Feb91	L21Feb91	27Mar91	09Apr91	33
*****	*****	905	CF PIPE TIE-INS P/ TO GROUT PMP 103	*	10	*	22Feb91	07Mar91	10Apr91	23Apr91	*
S	FS	940	WHC FILL VAULT #103 WITH WASTE GROUT		20		08Mar91	04Apr91	24Apr91	21May91	33
P	FS	9015	WHC OTP #105		10		22Feb91	L07Mar91	10Apr91	23Apr91	33
*****	*****	9055	CF PIPE TIE-INS P/ TO GROUT PMP 105	*	10	*	08Mar91	21Mar91	24Apr91	07May91	*
S	FS	9405	WHC FILL VAULT #105 WITH WASTE GROUT		20		22Mar91	18Apr91	08May91	05Jun91	33
P	FS	210	BKFL 3' OVER ROOF CAP VAULT #102		4		09Oct90	L12Oct90	09Oct90	12Oct90	0
*****	*****	907	DUST COVER OVER GRAVEL BARRIER #102	*	5	*	15Oct90	19Oct90	01Mar91	07Mar91	*
S	FS	900	WHC OTP #102		10		30Nov90	13Dec90	13Mar91	26Mar91	93
S	FS	991	DELIVER 3A DOCUMENTS 102				01Dec90	01Dec90	08Mar91	08Mar91	69
P	FS	2105	BKFL 3' OVER ROOF CAP VAULT #104		4		02Jan91	L07Jan91	02Jan91	07Jan91	0
*****	*****	9075	DUST COVER OVER GRAVEL BARRIER #104	*	5	*	08Jan91	14Jan91	01Mar91	07Mar91	*
S	FS	9005	WHC OTP #104		10		22Feb91	07Mar91	27Mar91	09Apr91	23
S	FS	995	DELIVER 3A DOCUMENTS 104/105				22Feb91	22Feb91	08Mar91	08Mar91	14
P	FS	211	BKFL 3' OVER ROOF CAP VAULT #103		4		14Dec90	L19Dec90	14Dec90	19Dec90	0
*****	*****	908	DUST COVER OVER GRAVEL BARRIER #103	*	5	*	20Dec90	28Dec90	01Mar91	07Mar91	*
S	FS	901	WHC OTP #103		10		07Feb91	21Feb91	27Mar91	09Apr91	33
S	FS	992	DELIVER 3A DOCUMENTS 103				07Feb91	07Feb91	08Mar91	08Mar91	29
P	FS	2115	BKFL 3' OVER ROOF CAP VAULT #105		4		02Jan91	L07Jan91	02Jan91	07Jan91	0
*****	*****	9085	DUST COVER OVER GRAVEL BARRIER #105	*	5	*	08Jan91	14Jan91	01Mar91	07Mar91	*
S	FS	9015	WHC OTP #105		10		22Feb91	07Mar91	10Apr91	23Apr91	33
S	FS	995	DELIVER 3A DOCUMENTS 104/105				22Feb91	22Feb91	08Mar91	08Mar91	14
P	FS	904	CF PIPE TIE-INS P/ TO GROUT PMP 102		10		14Dec90	L31Dec90	27Mar91	09Apr91	69
*****	*****	930	WHC FILL VAULT #102 WITH WASTE GROUT	*	20	*	02Jan91	29Jan91	10Apr91	07May91	*
S	FS	934	WHC REMOVE EQPT AFTER #102 FILL		5		30Jan91	05Feb91	08May91	14May91	69

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P FS	9045	CF PIPE TIE-INS P/ TO GROUT PMP 104	10	08Mar91	L21Mar91	10Apr91	23Apr91	23
*****	9305	WHC FILL VAULT #104 WITH WASTE GROUT	*	22Mar91	18Apr91	24Apr91	21May91	*
S FS	9345	WHC REMOVE EQPT AFTER #104 FILL	5	19Apr91	25Apr91	22May91	29May91	23
P FS	930	WHC FILL VAULT #102 WITH WASTE GROUT	20	02Jan91	L29Jan91	10Apr91	07May91	69
*****	934	WHC REMOVE EQPT AFTER #102 FILL	*	30Jan91	05Feb91	08May91	14May91	*
S FS	936	WHC COLD CAP GROUT PLACEMENT #102	20	06Feb91	06Mar91	15May91	12Jun91	69
P FS	9305	WHC FILL VAULT #104 WITH WASTE GROUT	20	22Mar91	L18Apr91	24Apr91	21May91	23
*****	9345	WHC REMOVE EQPT AFTER #104 FILL	*	19Apr91	25Apr91	22May91	29May91	*
S FS	9365	WHC COLD CAP GROUT PLACEMENT #104	20	26Apr91	23May91	30May91	26Jun91	23
P FS	934	WHC REMOVE EQPT AFTER #102 FILL	5	30Jan91	L05Feb91	08May91	14May91	69
*****	936	WHC COLD CAP GROUT PLACEMENT #102	*	06Feb91	06Mar91	15May91	12Jun91	*
S FS	938	WHC GROUT RISERS+CVR PENETR.#102	20	07Mar91	03Apr91	13Jun91	12Jul91	69
P FS	9345	WHC REMOVE EQPT AFTER #104 FILL	5	19Apr91	L25Apr91	22May91	29May91	23
*****	9365	WHC COLD CAP GROUT PLACEMENT #104	*	26Apr91	23May91	30May91	26Jun91	*
S FS	9385	WHC GROUT RISERS+CVR PENETR.#104	20	24May91	21Jun91	27Jun91	26Jul91	23
P FS	936	WHC COLD CAP GROUT PLACEMENT #102	20	06Feb91	L06Mar91	15May91	12Jun91	69
*****	938	WHC GROUT RISERS+CVR PENETR.#102	*	07Mar91	03Apr91	13Jun91	12Jul91	*
S FS	964	MOBILIZE CLSR COVER/ROADS 102/103	10	15Jul91	26Jul91	15Jul91	26Jul91	0
S FS	966	INSTL COVER LINER & GRAVEL ETC #102	15	29Jul91	16Aug91	29Jul91	16Aug91	0
P FS	9365	WHC COLD CAP GROUT PLACEMENT #104	20	26Apr91	L23May91	30May91	26Jun91	23
*****	9385	WHC GROUT RISERS+CVR PENETR.#104	*	24May91	21Jun91	27Jun91	26Jul91	*
S FS	9645	MOBILIZE CLSR COVER/ROADS 104/105	10	29Jul91	09Aug91	29Jul91	09Aug91	0
S FS	9665	INSTL COVER LINER & GRAVEL ETC #104	15	12Aug91	30Aug91	12Aug91	30Aug91	0
P FS	905	CF PIPE TIE-INS P/ TO GROUT PMP 103	10	22Feb91	L07Mar91	10Apr91	23Apr91	33
*****	940	WHC FILL VAULT #103 WITH WASTE GROUT	*	08Mar91	04Apr91	24Apr91	21May91	*
S FS	944	WHC REMOVE EQPT AFTER #103 FILL	5	05Apr91	11Apr91	22May91	29May91	33
P FS	9055	CF PIPE TIE-INS P/ TO GROUT PMP 105	10	08Mar91	L21Mar91	24Apr91	07May91	33
*****	9405	WHC FILL VAULT #105 WITH WASTE GROUT	*	22Mar91	18Apr91	08May91	05Jun91	*
S FS	9445	WHC REMOVE EQPT AFTER #105 FILL	5	19Apr91	25Apr91	06Jun91	12Jun91	33
P FS	940	WHC FILL VAULT #103 WITH WASTE GROUT	20	08Mar91	L04Apr91	24Apr91	21May91	33
*****	944	WHC REMOVE EQPT AFTER #103 FILL	*	05Apr91	11Apr91	22May91	29May91	*
S FS	946	WHC COLD CAP GROUT PLACEMENT #103	20	12Apr91	09May91	30May91	26Jun91	33

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CT REL LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
			TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
	NUMBER									
P FS	9405	WHC FILL VAULT #105 WITH WASTE GROUT	20		22Mar91	118Apr91	08May91	05Jun91	33	
*****	9445	WHC REMOVE EQPT AFTER #105 FILL	*	5	* 19Apr91	25Apr91	06Jun91	12Jun91	*	33
S FS	9465	WHC COLD CAP GROUT PLACEMENT #105	20		26Apr91	23May91	13Jun91	12Jul91	33	
P FS	944	WHC REMOVE EQPT AFTER #103 FILL	5		05Apr91	L11Apr91	22May91	29May91	33	
*****	946	WHC COLD CAP GROUT PLACEMENT #103	*	20	* 12Apr91	09May91	30May91	26Jun91	*	33
S FS	948	WHC GROUT RISERS+CVR PENETR.#103	20		10May91	07Jun91	27Jun91	26Jul91	33	
P FS	9445	WHC REMOVE EQPT AFTER #105 FILL	5		19Apr91	L25Apr91	06Jun91	12Jun91	33	
*****	9465	WHC COLD CAP GROUT PLACEMENT #105	*	20	* 26Apr91	23May91	13Jun91	12Jul91	*	33
S FS	9485	WHC GROUT RISERS+CVR PENETR.#105	20		24May91	21Jun91	15Jul91	09Aug91	33	
P FS	946	WHC COLD CAP GROUT PLACEMENT #103	20		12Apr91	L09May91	30May91	26Jun91	33	
*****	948	WHC GROUT RISERS+CVR PENETR.#103	*	20	* 10May91	07Jun91	27Jun91	26Jul91	*	33
S FS	967	INSTL COVER LINER & GRAVEL ETC #103	15		29Jul91	16Aug91	29Jul91	16Aug91	0	
P FS	9465	WHC COLD CAP GROUT PLACEMENT #105	20		26Apr91	L23May91	13Jun91	12Jul91	33	
*****	9485	WHC GROUT RISERS+CVR PENETR.#105	*	20	* 24May91	21Jun91	15Jul91	09Aug91	*	33
S FS	9675	INSTL COVER LINER & GRAVEL ETC #105	15		12Aug91	30Aug91	12Aug91	30Aug91	0	
P FS	211	BKFL 3' OVER ROOF CAP VAULT #103	4		14Dec90	L19Dec90	14Dec90	19Dec90	0	
*****	960	BID/AWARD CP 4A CL CVR/ROADS 102/103	*	60	* E20Dec90	19Mar91	20Feb91	14May91	*	40
S FS	962	CLSR CVR SUBM APPRV & DEL 102/103	40		20Mar91	14May91	15May91	12Jul91	40	
S FS	972	SUBM & APPRV RUN-ON/OFF DR 102/103	15		20Mar91	09Apr91	20Jun91	12Jul91	65	
P FS	2115	BKFL 3' OVER ROOF CAP VAULT #105	4		02Jan91	L07Jan91	02Jan91	07Jan91	0	
*****	9605	BID/AWARD CP 4B CL CVR/ROADS 104/105	*	60	* E08Jan91	02Apr91	06Mar91	29May91	*	40
S FS	9625	CLSR CVR SUBM APPRV & DEL 104/105	40		03Apr91	29May91	30May91	26Jul91	40	
S FS	9725	SUBM & APPRV RUN-ON/OFF DR. 104/105	15		03Apr91	23Apr91	08Jul91	26Jul91	65	
P FS	960	BID/AWARD CP 4A CL CVR/ROADS 102/103	60		20Dec90	L19Mar91	20Feb91	14May91	40	
*****	962	CLSR CVR SUBM APPRV & DEL 102/103	*	40	* 20Mar91	14May91	15May91	12Jul91	*	40
S FS	964	MOBILIZE CLSR COVER/ROADS 102/103	10		15Jul91	26Jul91	15Jul91	26Jul91	0	
P FS	9605	BID/AWARD CP 4B CL CVR/ROADS 104/105	60		08Jan91	L02Apr91	06Mar91	29May91	40	
*****	9625	CLSR CVR SUBM APPRV & DEL 104/105	*	40	* 03Apr91	29May91	30May91	26Jul91	*	40
S FS	9645	MOBILIZE CLSR COVER/ROADS 104/105	10		29Jul91	09Aug91	29Jul91	09Aug91	0	

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					TOTAL	REM.	START	FINISH	START	FINISH	FLOAT
P	FS	938	WHC GROUT RISERS+CVR PENETR.#102		20		07Mar91	L03Apr91	13Jun91	12Jul91	69
P	FS	962	CLSR CVR SUBM APPRV & DEL 102/103		40		20Mar91	14May91	15May91	12Jul91	40
P	FS	972	SUBM & APPRV RUN-ON/OFF DR 102/103		15		20Mar91	09Apr91	20Jun91	12Jul91	65
P	FS	P114	SUBMITTALS - CLSR CVR/ROADS 102/103		60		17Apr91	12Jul91	17Apr91	12Jul91	0
*****	*****	964	MOBILIZE CLSR COVER/ROADS 102/103	*	10	*	15Jul91	26Jul91	15Jul91	26Jul91	*
S	FS	966	INSTL COVER LINER & GRAVEL ETC #102		15		29Jul91	16Aug91	29Jul91	16Aug91	0
S	FS	967	INSTL COVER LINER & GRAVEL ETC #103		15		29Jul91	16Aug91	29Jul91	16Aug91	0
S	FS	976	INSTL ROADS & DITCHES 102/103		15		19Aug91	09Sep91	19Aug91	09Sep91	0
P	FS	9385	WHC GROUT RISERS+CVR PENETR.#104		20		24May91	L21Jun91	27Jun91	26Jul91	23
P	FS	9625	CLSR CVR SUBM APPRV & DEL 104/105		40		03Apr91	29May91	30May91	26Jul91	40
P	FS	9725	SUBM & APPRV RUN-ON/OFF DR. 104/105		15		03Apr91	23Apr91	08Jul91	26Jul91	65
P	FS	P1145	SUBMITTALS - CLSR CVR/ROADS 104/105		60		01May91	26Jul91	01May91	26Jul91	0
*****	*****	9645	MOBILIZE CLSR COVER/ROADS 104/105	*	10	*	29Jul91	09Aug91	29Jul91	09Aug91	*
S	FS	9665	INSTL COVER LINER & GRAVEL ETC #104		15		12Aug91	30Aug91	12Aug91	30Aug91	0
S	FS	9675	INSTL COVER LINER & GRAVEL ETC #105		15		12Aug91	30Aug91	12Aug91	30Aug91	0
S	FS	9765	INSTL ROADS & DITCHES 104/105		15		03Sep91	23Sep91	03Sep91	23Sep91	0
P	FS	938	WHC GROUT RISERS+CVR PENETR.#102		20		07Mar91	L03Apr91	13Jun91	12Jul91	69
P	FS	964	MOBILIZE CLSR COVER/ROADS 102/103		10		15Jul91	26Jul91	15Jul91	26Jul91	0
*****	*****	966	INSTL COVER LINER & GRAVEL ETC #102	*	15	*	29Jul91	16Aug91	29Jul91	16Aug91	*
S	FS	976	INSTL ROADS & DITCHES 102/103		15		19Aug91	09Sep91	19Aug91	09Sep91	0
P	FS	9385	WHC GROUT RISERS+CVR PENETR.#104		20		24May91	L21Jun91	27Jun91	26Jul91	23
P	FS	9645	MOBILIZE CLSR COVER/ROADS 104/105		10		29Jul91	09Aug91	29Jul91	09Aug91	0
*****	*****	9665	INSTL COVER LINER & GRAVEL ETC #104	*	15	*	12Aug91	30Aug91	12Aug91	30Aug91	*
S	FS	9765	INSTL ROADS & DITCHES 104/105		15		03Sep91	23Sep91	03Sep91	23Sep91	0
P	FS	948	WHC GROUT RISERS+CVR PENETR.#103		20		10May91	L07Jun91	27Jun91	26Jul91	33
P	FS	964	MOBILIZE CLSR COVER/ROADS 102/103		10		15Jul91	26Jul91	15Jul91	26Jul91	0
*****	*****	967	INSTL COVER LINER & GRAVEL ETC #103	*	15	*	29Jul91	16Aug91	29Jul91	16Aug91	*
S	FS	976	INSTL ROADS & DITCHES 102/103		15		19Aug91	09Sep91	19Aug91	09Sep91	0
S	FS	P111	COMPLETE 4A CLSR CVR/ROADS 102/103				10Sep91	10Sep91	10Sep91	10Sep91	0
P	FS	9485	WHC GROUT RISERS+CVR PENETR.#105		20		24May91	L21Jun91	15Jul91	09Aug91	33
P	FS	9645	MOBILIZE CLSR COVER/ROADS 104/105		10		29Jul91	09Aug91	29Jul91	09Aug91	0
*****	*****	9675	INSTL COVER LINER & GRAVEL ETC #105	*	15	*	12Aug91	30Aug91	12Aug91	30Aug91	*
S	FS	9765	INSTL ROADS & DITCHES 104/105		15		03Sep91	23Sep91	03Sep91	23Sep91	0
S	FS	P1115	COMPLETE 4B CLSR CVR/ROADS 104/105				24Sep91	24Sep91	24Sep91	24Sep91	0

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 KAISER ENGINEERS HANFORD
 REPORT A

GROUT VAULT PAIRS 102/103 & 104/105
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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		960	BID/AWARD CP 4A CL CVR/ROADS 102/103	60		20Dec90	L19Mar91	20Feb91	14May91	40	
*****	*****		972	SUBM & APPRV RUN-ON/OFF DR 102/103	*	15	*	20Mar91	09Apr91	20Jun91	12Jul91	*
S	FS		964	MOBILIZE CLSR COVER/ROADS 102/103		10		15Jul91	26Jul91	15Jul91	26Jul91	0
P	FS		9605	BID/AWARD CP 4B CL CVR/ROADS 104/105	60		08Jan91	L02Apr91	06Mar91	29May91	40	
*****	*****		9725	SUBM & APPRV RUN-ON/OFF DR. 104/105	*	15	*	03Apr91	23Apr91	08Jul91	26Jul91	*
S	FS		9645	MOBILIZE CLSR COVER/ROADS 104/105		10		29Jul91	09Aug91	29Jul91	09Aug91	0
P	FS		964	MOBILIZE CLSR COVER/ROADS 102/103	10		15Jul91	L26Jul91	15Jul91	26Jul91	0	
P	FS		966	INSTL COVER LINER & GRAVEL ETC #102	15		29Jul91	16Aug91	29Jul91	16Aug91	0	
P	FS		967	INSTL COVER LINER & GRAVEL ETC #103	15		29Jul91	16Aug91	29Jul91	16Aug91	0	
*****	*****		976	INSTL ROADS & DITCHES 102/103	*	15	*	19Aug91	09Sep91	19Aug91	09Sep91	*
S	FS		P111	COMPLETE 4A CLSR CVR/ROADS 102/103				10Sep91	10Sep91	10Sep91	10Sep91	0
P	FS		9645	MOBILIZE CLSR COVER/ROADS 104/105	10		29Jul91	L09Aug91	29Jul91	09Aug91	0	
P	FS		9665	INSTL COVER LINER & GRAVEL ETC #104	15		12Aug91	30Aug91	12Aug91	30Aug91	0	
P	FS		9675	INSTL COVER LINER & GRAVEL ETC #105	15		12Aug91	30Aug91	12Aug91	30Aug91	0	
*****	*****		9765	INSTL ROADS & DITCHES 104/105	*	15	*	03Sep91	23Sep91	03Sep91	23Sep91	*
S	FS		P1115	COMPLETE 4B CLSR CVR/ROADS 104/105				24Sep91	24Sep91	24Sep91	24Sep91	0
P	FS		230	INSTL INSTRUMENTATION 102	10		12Sep90	L25Sep90	22Feb91	07Mar91	111	
P	FS		231	INSTL INSTRUMENTATION 103	10		15Nov90	30Nov90	22Feb91	07Mar91	65	
P	FS		260	BERM 3' BKFL OVER NEW PIPELINES #102	4		26Nov90	29Nov90	26Nov90	29Nov90	0	
P	FS		410	INSTL PIT COVER BLOCKS 102	2		26Sep90	27Sep90	28Nov90	29Nov90	43	
P	FS		907	DUST COVER OVER GRAVEL BARRIER #102	5		15Oct90	19Oct90	01Mar91	07Mar91	93	
*****	*****		991	DELIVER 3A DOCUMENTS 102	*		*	01Dec90	01Dec90	08Mar91	08Mar91	*
S	FS		P110	COMPLETE KEH-5162 & DEMOBILIZE	30			08Mar91	18Apr91	08Mar91	18Apr91	0
P	FS		261	BERM 3' BKFL OVER NEW PIPELINES #103	4		01Feb91	L06Feb91	15Feb91	21Feb91	10	
P	FS		411	INSTL PIT COVER BLOCKS 103	2		03Dec90	04Dec90	20Feb91	21Feb91	53	
P	FS		908	DUST COVER OVER GRAVEL BARRIER #103	5		20Dec90	28Dec90	01Mar91	07Mar91	47	
*****	*****		992	DELIVER 3A DOCUMENTS 103	*		*	07Feb91	07Feb91	08Mar91	08Mar91	*
S	FS		P110	COMPLETE KEH-5162 & DEMOBILIZE	30			08Mar91	18Apr91	08Mar91	18Apr91	0

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P FS	2305	INSTL INSTRUMENTATION 104	10	03Dec90	L14Dec90	22Feb91	07Mar91	55	
P FS	2315	INSTL INSTRUMENTATION 105	10	03Dec90	14Dec90	22Feb91	07Mar91	55	
P FS	2605	BERM 3' BKFL OVER NEW PIPELINES #104	4	15Feb91	21Feb91	15Feb91	21Feb91	0	
P FS	2615	BERM 3' BKFL OVER NEW PIPELINES #105	4	15Feb91	21Feb91	15Feb91	21Feb91	0	
P FS	4105	INSTL PIT COVER BLOCKS 104	2	17Dec90	18Dec90	20Feb91	21Feb91	43	
P FS	4115	INSTL PIT COVER BLOCKS 105	2	17Dec90	18Dec90	20Feb91	21Feb91	43	
P FS	9075	DUST COVER OVER GRAVEL BARRIER #104	5	08Jan91	14Jan91	01Mar91	07Mar91	37	
P FS	9085	DUST COVER OVER GRAVEL BARRIER #105	5	08Jan91	14Jan91	01Mar91	07Mar91	37	
*****	995	DELIVER 3A DOCUMENTS 104/105	*	*	22Feb91	22Feb91	08Mar91	08Mar91 *	14
S FS	P110	COMPLETE KEH-5162 & DEMOBILIZE	30	08Mar91	18Apr91	08Mar91	18Apr91	0	
P FS	164	SEAL ROOF PANELS #102	5	21Aug90	L27Aug90	21Aug90	27Aug90	0	
*****	A01	PENETRATIONS IN ROOF PANELS #102	*	10	* 28Aug90	11Sep90	07Feb91	21Feb91 *	111
S FS	230	INSTL INSTRUMENTATION 102	10	12Sep90	25Sep90	22Feb91	07Mar91	111	
P FS	1645	SEAL ROOF PANELS #104	5	08Nov90	L14Nov90	08Nov90	14Nov90	0	
*****	A015	PENETRATIONS IN ROOF PANELS #104	*	10	* 15Nov90	30Nov90	07Feb91	21Feb91 *	55
S FS	2305	INSTL INSTRUMENTATION 104	10	03Dec90	14Dec90	22Feb91	07Mar91	55	
P FS	094	FILL, HYDRO & EMPTY VAULT #102	10	29Jun90	L16Jul90	29Jun90	16Jul90	0	
*****	A02	DRAINAGE NET #102	*	10	* 17Jul90	30Jul90	31Jul90	13Aug90 *	10
S FS	156	SET ROOF PANELS #102	5	14Aug90	20Aug90	14Aug90	20Aug90	0	
P FS	0945	FILL, HYDRO & EMPTY VAULT #104	10	20Sep90	L03Oct90	20Sep90	03Oct90	0	
*****	A025	DRAINAGE NET #104	*	10	* 04Oct90	17Oct90	18Oct90	31Oct90 *	10
S FS	1565	SET ROOF PANELS #104	5	01Nov90	07Nov90	01Nov90	07Nov90	0	
P FS	166	SEAL ROOF PANELS #103	5	25Oct90	L31Oct90	25Oct90	31Oct90	0	
*****	A11	PENETRATIONS IN ROOF PANELS #103	*	10	* 01Nov90	14Nov90	07Feb91	21Feb91 *	65
S FS	231	INSTL INSTRUMENTATION 103	10	15Nov90	30Nov90	22Feb91	07Mar91	65	
P FS	1665	SEAL ROOF PANELS #105	5	08Nov90	L14Nov90	08Nov90	14Nov90	0	
*****	A115	PENETRATIONS IN ROOF PANELS #105	*	10	* 15Nov90	30Nov90	07Feb91	21Feb91 *	55
S FS	2315	INSTL INSTRUMENTATION 105	10	03Dec90	14Dec90	22Feb91	07Mar91	55	
P FS	096	FILL, HYDRO & EMPTY VAULT #103	10	17Jul90	L30Jul90	17Jul90	30Jul90	0	
*****	A22	DRAINAGE NET #103	*	10	* 31Jul90	13Aug90	04Oct90	17Oct90 *	46
S FS	160	SET ROOF PANELS #103	5	18Oct90	24Oct90	18Oct90	24Oct90	0	
P FS	0965	FILL, HYDRO & EMPTY VAULT #105	10	04Oct90	L17Oct90	04Oct90	17Oct90	0	
*****	A225	DRAINAGE NET #105	*	10	* 18Oct90	31Oct90	18Oct90	31Oct90 *	0
S FS	1605	SET ROOF PANELS #105	5	01Nov90	07Nov90	01Nov90	07Nov90	0	

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P	FS	052	SUBMIT/APPR LINER QA PLAN		5		10Aug89	L16Aug89	14Sep89	20Sep89	24	
*****	NA10		SUBMITTALS 02755 LINERS 102-103	*	22	*	17Aug89	18Sep89	21Sep89	20Oct89	*	24
S	FS	054	FACTORY PREPARE LINERS 102/103		30		19Sep89	30Oct89	23Oct89	05Dec89		24
P	FS	400	ELEC SUBMITTALS 16300, 16400 & 16640		22		10Aug89	L11Sep89	25Jul90	23Aug90		239
P	FS	NA15	SUBMITTALS 13440 INSTR		22		10Aug89	11Sep89	25Jul90	23Aug90		239
*****	NA11		DELIVER ELEC MATL 102/103	*	40	*	12Sep89	06Nov89	24Aug90	19Oct90	*	239
S	FS	226	CATHODIC PROTECTION AT TGE		15		07Nov89	29Nov89	27Feb91	19Mar91		325
S	FS	2265	CATHODIC PROTECTION FOR PIPE TO #101		15		07Nov89	29Nov89	27Feb91	19Mar91		325
S	FS	402	MISC ELEC NOT IN EXCAV AREA 102/103		60		07Nov89	05Feb90	22Oct90	18Jan91		239
S	FS	404	INSTALL ELECTRICAL #102		30		14Aug90	25Sep90	22Jan91	05Mar91		239
S	FS	405	INSTALL ELECTRICAL #103 & #104		30		01Nov90	14Dec90	05Feb91	19Mar91		63
P	FS	NA15	SUBMITTALS 13440 INSTR		22		10Aug89	L11Sep89	25Jul90	23Aug90		239
P	FS	S100	SUBMITTALS FOR VAULTS 104-105		30		03Oct89	13Nov89	28Nov89	11Jan90		38
*****	NA115		DELIVER ELEC MATL 104/105	*	40	*	14Nov89	15Jan90	20Dec90	19Feb91	*	275
S	FS	4055	INSTALL ELECTRICAL #105		30		01Nov90	14Dec90	20Feb91	02Apr91		73
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT		85		10Apr89	L09Aug89	10Apr89	09Aug89		0
*****	NA12		SUBMITTALS 03301 CONC 05500 METAL	*	22	*	10Aug89	11Sep89	19Sep89	18Oct89	*	27
S	FS	038	FR & P #102 CB SLAB & CRB		20		19Oct89	15Nov89	19Oct89	15Nov89		0
S	FS	044	FR & P #103 CB SLAB & CRB		20		19Oct89	15Nov89	19Oct89	15Nov89		0
S	FS	P119	DRAIN SEAL ASSEMBLY #102		20		12Sep89	09Oct89	29Oct90	27Nov90		284
S	FS	P120	DRAIN SEAL ASSEMBLY #103		20		12Sep89	09Oct89	22Jan91	19Feb91		340
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT		85		10Apr89	L09Aug89	10Apr89	09Aug89		0
*****	NA13		SUBMITTALS 09885 ASPHALT	*	22	*	10Aug89	11Sep89	15May90	14Jun90	*	191
S	FS	093	COAT/CURE VAULT #102 WALLS - ASPHALT		10		15Jun90	28Jun90	15Jun90	28Jun90		0
S	FS	0935	COAT/CURE VAULT #104 WALLS - ASPHALT		10		06Sep90	19Sep90	06Sep90	19Sep90		0
S	FS	095	COAT/CURE VAULT #103 WALLS - ASPHALT		10		15Jun90	28Jun90	29Jun90	16Jul90		10
S	FS	0955	COAT/CURE VAULT #105 WALLS - ASPHALT		10		06Sep90	19Sep90	20Sep90	03Oct90		10
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT		85		10Apr89	L09Aug89	10Apr89	09Aug89		0
*****	NA14		SUBMITTALS 03300 CAST-IN-PLACE CONC	*	22	*	10Aug89	11Sep89	17Oct89	15Nov89	*	47
S	FS	101	FR & P LEACHATE COLL. PIT FND #102		10		19Oct89	01Nov89	16Nov89	01Dec89		20
S	FS	104	STRIP & CURE LEACH. COLL. PIT FND 103		10		02Nov89	15Nov89	04Dec89	15Dec89		20
S	FS	170	FR & P 4 EXCESS WTR PITS #102		15		28Aug90	18Sep90	28Aug90	18Sep90		0
S	FS	178	FR & P LEACHATE PIT #102		7		28Aug90	06Sep90	28Sep90	08Oct90		22
S	FS	P108	FAB PIT COVER BLOCKS #102		30		12Sep89	23Oct89	15Oct90	27Nov90		274
S	FS	P109	FAB PIT COVER BLOCKS #103		30		12Sep89	23Oct89	08Jan91	19Feb91		330

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			DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
			TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85		10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	*****	NA15	SUBMITTALS 13440 INSTR	*	22	*	10Aug89	11Sep89	25Jul90	* 239
S	FS	NA11	DELIVER ELEC MATL 102/103		40		12Sep89	06Nov89	24Aug90	190ct90
S	FS	NA115	DELIVER ELEC MATL 104/105		40		14Nov89	15Jan90	20Dec90	19Feb91
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85		10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	*****	NA17	SUBMITTALS 09805 SPC CVR BLKS	*	22	*	10Aug89	11Sep89	13Sep90	* 274
S	FS	P108	FAB PIT COVER BLOCKS #102		30		12Sep89	23Oct89	15Oct90	27Nov90
S	FS	P109	FAB PIT COVER BLOCKS #103		30		12Sep89	23Oct89	08Jan91	19Feb91
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85		10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	*****	NA3	KEH-5162 FINALALIZE/APPR QA PROGRAM	*	5	*	10Aug89	16Aug89	30Aug89	06Sep89 * 14
S	FS	NA4	SUBM 02200 EARTHWORK		15		17Aug89	07Sep89	07Sep89	27Sep89 14
P	FS	NA3	KEH-5162 FINALALIZE/APPR QA PROGRAM	*	5		10Aug89	L16Aug89	30Aug89	06Sep89
*****	*****	NA4	SUBM 02200 EARTHWORK	*	15	*	17Aug89	07Sep89	07Sep89	27Sep89 * 14
S	FS	NA5	EXCAVATE TO GRADE 102/103		3		28Sep89	02Oct89	28Sep89	02Oct89 0
P	FS	020	SUBMITTALS, DIV 1 & GC KEH-5162		15		10Aug89	L30Aug89	10Aug89	30Aug89 0
P	FS	022	MOBILIZE KEH-5162		20		30Aug89	27Sep89	30Aug89	27Sep89 0
P	FS	NA4	SUBM 02200 EARTHWORK		15		17Aug89	07Sep89	07Sep89	27Sep89 14
*****	*****	NA5	EXCAVATE TO GRADE 102/103	*	3	*	28Sep89	02Oct89	28Sep89	02Oct89 * 0
S	FS	028	DIFF. BREAK UNDER CB SLABS 102/103		10		03Oct89	16Oct89	03Oct89	16Oct89 0
P	FS	148	BID & AWARD KEH-5162 GROUT VAULT	85		10Apr89	L09Aug89	10Apr89	09Aug89	0
*****	*****	NA6	SUBM 02145 GRAVEL DIFF. BRK.	*	22	*	10Aug89	11Sep89	17Aug89	18Sep89 * 5
S	FS	025	PRODUCE DIFF. BRK. GRAVEL 102/103		10		12Sep89	25Sep89	19Sep89	02Oct89 5
S	FS	0255	PRODUCE DIFF. BRK. GRAVEL 104/105		10		12Sep89	25Sep89	08Dec89	21Dec89 61
P	FS	150	SUBM. APPR; 03419 - ROOF PANELS	*	22		10Aug89	L11Sep89	11Jun90	12Jul90 209
*****	*****	NA7	FAB/DEL ROOF PANELS 102	*	22	*	12Sep89	11Oct89	13Jul90	13Aug90 * 209
S	FS	156	SET ROOF PANELS #102		5		14Aug90	20Aug90	14Aug90	20Aug90 0
P	FS	150	SUBM. APPR; 03419 - ROOF PANELS	*	22		10Aug89	L11Sep89	11Jun90	12Jul90 209
*****	*****	NA71	FAB/DEL ROOF PANELS 103	*	22	*	12Sep89	11Oct89	18Sep90	17Oct90 * 255
S	FS	160	SET ROOF PANELS #103		5		18Oct90	24Oct90	18Oct90	24Oct90 0
P	FS	S100	SUBMITTALS FOR VAULTS 104-105		30		03Oct89	L13Nov89	28Nov89	11Jan90 38
*****	*****	NA75	FAB/DEL ROOF PANELS 104/105	*	22	*	14Nov89	15Dec89	02Oct90	31Oct90 * 220
S	FS	1565	SET ROOF PANELS #104		5		01Nov90	07Nov90	01Nov90	07Nov90 0
S	FS	1605	SET ROOF PANELS #105		5		01Nov90	07Nov90	01Nov90	07Nov90 0

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P FS	P106	SUBM - LCHT SUMP/RISER (4EA)	22	10Aug89	L11Sep89	19Sep89	18Oct89	27	
*****	NA9	FAB/DEL LEACH. SUMP/RISER 102/103	*	40	*	12Sep89	06Nov89	19Oct89	15Dec89 *
S FS	034	ENCASE LEACHATE COLL. LINER #102	12			16Nov89	05Dec89	18Dec89	05Jan90 20
S FS	036	ENCASE LEACHATE COLL. LINER #103	12			16Nov89	05Dec89	18Dec89	05Jan90 20
P FS	S100	SUBMITTALS FOR VAULTS 104-105	30			03Oct89	L13Nov89	28Nov89	11Jan90 38
*****	NA95	FAB/DEL LEACH. SUMP/RISER 104/105	*	40	*	14Nov89	15Jan90	12Jan90	09Mar90 *
S FS	0345	ENCASE LEACHATE COLL. LINER #104	12			16Jan90	31Jan90	12Mar90	27Mar90 38
S FS	0365	ENCASE LEACHATE COLL. LINER #105	12			16Jan90	31Jan90	26Mar90	10Apr90 48
P FS	P104	ISSUE DWGS FOR 104/105 DESIGN	1			27Jul89	L27Jul89	22Nov89	22Nov89 83
*****	P100	NOTICE TO PROCEED VAULTS 104 & 105	*	1	*	E02Oct89	02Oct89	27Nov89	27Nov89 *
S FS	S100	SUBMITTALS FOR VAULTS 104-105	30			03Oct89	13Nov89	28Nov89	11Jan90 38
P FS	0055	DESIGN VAULTS 104/105	80			E03Apr89	L26Jul89	06Apr89	31Jul89 3
*****	P104	ISSUE DWGS FOR 104/105 DESIGN	*	1	*	27Jul89	27Jul89	22Nov89	22Nov89 *
S FS	P100	NOTICE TO PROCEED VAULTS 104 & 105	1			E02Oct89	02Oct89	27Nov89	27Nov89 38
P FS	P107	BID & AWARD CLSR CVR/ROADS 102/103	40			20Dec90	L19Feb91	20Dec90	19Feb91 0
*****	P105	QA PLAN CLSR CVR/ROADS 102/103	*	40	*	20Feb91	16Apr91	20Feb91	16Apr91 *
S FS	P114	SUBMITTALS - CLSR CVR/ROADS 102/103	60			17Apr91	12Jul91	17Apr91	12Jul91 0
P FS	P1075	BID & AWARD CLSR CVR/ROADS 104/105	40			08Jan91	L05Mar91	08Jan91	05Mar91 0
*****	P1055	QA PLAN CLRS CVR/ROADS 104/105	*	40	*	06Mar91	30Apr91	06Mar91	30Apr91 *
S FS	P1145	SUBMITTALS - CLSR CVR/ROADS 104/105	60			01May91	26Jul91	01May91	26Jul91 0
P FS	148	BID & AWARD KEH-5162 GROUT VAULT	85			10Apr89	L09Aug89	10Apr89	09Aug89 0
*****	P106	SUBM - LCHT SUMP/RISER (4EA)	*	22	*	10Aug89	11Sep89	19Sep89	18Oct89 *
S FS	NA9	FAB/DEL LEACH. SUMP/RISER 102/103	40			12Sep89	06Nov89	19Oct89	15Dec89 27
P FS	211	BKFL 3' OVER ROOF CAP VAULT #103	4			14Dec90	L19Dec90	14Dec90	19Dec90 0
*****	P107	BID & AWARD CLSR CVR/ROADS 102/103	*	40	*	20Dec90	19Feb91	20Dec90	19Feb91 *
S FS	P105	QA PLAN CLSR CVR/ROADS 102/103	40			20Feb91	16Apr91	20Feb91	16Apr91 0
P FS	2115	BKFL 3' OVER ROOF CAP VAULT #105	4			02Jan91	L07Jan91	02Jan91	07Jan91 0
*****	P1075	BID & AWARD CLSR CVR/ROADS 104/105	*	40	*	08Jan91	05Mar91	08Jan91	05Mar91 *
S FS	P1055	QA PLAN CLRS CVR/ROADS 104/105	40			06Mar91	30Apr91	06Mar91	30Apr91 0
P FS	NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC	22			10Aug89	L11Sep89	17Oct89	15Nov89 47
P FS	NA17	SUBMITTALS 09805 SPC CVR BLKS	22			10Aug89	11Sep89	13Sep90	12Oct90 274
*****	P108	FAB PIT COVER BLOCKS #102	*	30	*	12Sep89	23Oct89	15Oct90	27Nov90 *
S FS	410	INSTL PIT COVER BLOCKS 102	2			26Sep90	27Sep90	28Nov90	29Nov90 43

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P	FS	S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	L13Nov89	28Nov89	11Jan90	38		
*****	P1085	FAB PIT COVER BLOCKS #104		*	30	*	14Nov89	29Dec89	08Jan91	* 285	
S	FS	4105	INSTL PIT COVER BLOCKS 104	2		17Dec90	18Dec90	20Feb91	21Feb91	43	
P	FS	NA14	SUBMITTALS 03300 CAST-IN-PLACE CONC	22		10Aug89	L11Sep89	17Oct89	15Nov89	47	
P	FS	NA17	SUBMITTALS 09805 SPC CVR BLKS	22		10Aug89	11Sep89	13Sep90	12Oct90	274	
*****	P109	FAB PIT COVER BLOCKS #103		*	30	*	12Sep89	23Oct89	08Jan91	* 330	
S	FS	411	INSTL PIT COVER BLOCKS 103	2		03Dec90	04Dec90	20Feb91	21Feb91	53	
P	FS	S100	SUBMITTALS FOR VAULTS 104-105	30		03Oct89	L13Nov89	28Nov89	11Jan90	38	
*****	P1095	FAB PIT COVER BLOCKS #105		*	30	*	14Nov89	29Dec89	08Jan91	* 285	
S	FS	4115	INSTL PIT COVER BLOCKS 105	2		17Dec90	18Dec90	20Feb91	21Feb91	43	
P	FS	991	DELIVER 3A DOCUMENTS 102			01Dec90	L01Dec90	08Mar91	08Mar91	97	
P	FS	992	DELIVER 3A DOCUMENTS 103			07Feb91	07Feb91	08Mar91	08Mar91	29	
P	FS	995	DELIVER 3A DOCUMENTS 104/105			22Feb91	22Feb91	08Mar91	08Mar91	14	
P	FS	W03	WEATHER DELAY TIME #103	10		07Feb91	21Feb91	22Feb91	07Mar91	10	
P	FS	W04	WEATHER DELAY TIME #104	10		22Feb91	07Mar91	22Feb91	07Mar91	0	
P	FS	W05	WEATHER DELAY TIME #105	10		22Feb91	07Mar91	22Feb91	07Mar91	0	
*****	P110	COMPLETE KEH-5162 & DEMOBILIZE		*	30	*	08Mar91	18Apr91	08Mar91	18Apr91 *	0
P	FS	967	INSTL COVER LINER & GRAVEL ETC #103	15		29Jul91	L16Aug91	29Jul91	16Aug91	0	
P	FS	976	INSTL ROADS & DITCHES 102/103	15		19Aug91	09Sep91	19Aug91	09Sep91	0	
*****	P111	COMPLETE 4A CLSR CVR/ROADS 102/103		*		*	10Sep91	10Sep91	10Sep91	10Sep91 *	0
P	FS	9675	INSTL COVER LINER & GRAVEL ETC #105	15		12Aug91	L30Aug91	12Aug91	30Aug91	0	
P	FS	9765	INSTL ROADS & DITCHES 104/105	15		03Sep91	23Sep91	03Sep91	23Sep91	0	
*****	P1115	COMPLETE 4B CLSR CVR/ROADS 104/105		*		*	24Sep91	24Sep91	24Sep91	24Sep91 *	0
P	FS	112	BKFL TO TOP OF WALLS VAULT #102	10		31Jul90	L13Aug90	31Jul90	13Aug90	0	
*****	P112	EXCAV FOR PIPES TO 102/103		*	2	*	14Aug90	15Aug90	25Sep90	26Sep90 *	29
S	FS	P113	INSTL PIPES TO 102/103	15		16Aug90	06Sep90	27Sep90	17Oct90	29	
P	FS	006	CF GROUND MONITORING WELL	10		18Oct90	L31Oct90	18Oct90	31Oct90	0	
P	FS	1135	BKFL TO TOP OF WALLS VAULT #105	10		18Oct90	31Oct90	18Oct90	31Oct90	0	
*****	P1125	EXCAV FOR PIPES TO 104/105		*	2	*	01Nov90	02Nov90	14Dec90	17Dec90 *	29
S	FS	P1135	INSTL PIPES TO 104/105	15		05Nov90	27Nov90	18Dec90	10Jan91	29	

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
			NUMBER		TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		215	PREFAB PIPELINES 102/103	75		12Sep89	L29Dec89	11Jun90	26Sep90	187	
P	FS		P112	EXCAV FOR PIPES TO 102/103	2		14Aug90	15Aug90	25Sep90	26Sep90	29	
*****	*****		P113	INSTL PIPES TO 102/103	*	15	*	16Aug90	06Sep90	27Sep90	17Oct90 *	29
S	FS		220	RUN PIPE LINES TO VALVE PIT #102	20		18Oct90	14Nov90	18Oct90	14Nov90	0	
S	FS		222	CATHODIC PROTECTION FOR PIPE TO #102	15		07Sep90	27Sep90	27Feb91	19Mar91	117	
S	FS		224	RUN PIPE LINES TO VALVE PIT #103	20		27Dec90	24Jan91	11Jan91	07Feb91	10	
P	FS		2155	PREFAB PIPELINES 104/105	75		14Nov89	L06Mar90	30Aug90	17Dec90	198	
P	FS		P1125	EXCAV FOR PIPES TO 104/105	2		01Nov90	02Nov90	14Dec90	17Dec90	29	
*****	*****		P1135	INSTL PIPES TO 104/105	*	15	*	05Nov90	27Nov90	18Dec90	10Jan91 *	29
S	FS		2205	RUN PIPE LINES TO VALVE PIT #104	20		11Jan91	07Feb91	11Jan91	07Feb91	0	
S	FS		2225	CATHODIC PROTECTION FOR PIPE TO #104	15		28Nov90	18Dec90	13Mar91	02Apr91	71	
S	FS		2245	RUN PIPE LINES TO VALVE PIT #105	20		11Jan91	07Feb91	11Jan91	07Feb91	0	
P	FS		P105	QA PLAN CLSR CVR/ROADS 102/103	40		20Feb91	L16Apr91	20Feb91	16Apr91	0	
*****	*****		P114	SUBMITTALS - CLSR CVR/ROADS 102/103	*	60	*	17Apr91	12Jul91	17Apr91	12Jul91 *	0
S	FS		964	MOBILIZE CLSR COVER/ROADS 102/103	10		15Jul91	26Jul91	15Jul91	26Jul91	0	
P	FS		P1055	QA PLAN CLRS CVR/ROADS 104/105	40		06Mar91	L30Apr91	06Mar91	30Apr91	0	
*****	*****		P1145	SUBMITTALS - CLSR CVR/ROADS 104/105	*	60	*	01May91	26Jul91	01May91	26Jul91 *	0
S	FS		9645	MOBILIZE CLSR COVER/ROADS 104/105	10		29Jul91	09Aug91	29Jul91	09Aug91	0	
P	FS		220	RUN PIPE LINES TO VALVE PIT #102	20		18Oct90	L14Nov90	18Oct90	14Nov90	0	
*****	*****		P115	URETHANE FOAM PIPE BENDS #102	*	5	*	15Nov90	21Nov90	15Nov90	21Nov90 *	0
S	FS		260	BERM 3' BKFL OVER NEW PIPELINES #102	4		26Nov90	29Nov90	26Nov90	29Nov90	0	
P	FS		2205	RUN PIPE LINES TO VALVE PIT #104	20		11Jan91	L07Feb91	11Jan91	07Feb91	0	
*****	*****		P1155	URETHANE FOAM PIPE BENDS #104	*	5	*	08Feb91	14Feb91	08Feb91	14Feb91 *	0
S	FS		2605	BERM 3' BKFL OVER NEW PIPELINES #104	4		15Feb91	21Feb91	15Feb91	21Feb91	0	
P	FS		224	RUN PIPE LINES TO VALVE PIT #103	20		27Dec90	L24Jan91	11Jan91	07Feb91	10	
*****	*****		P116	URETHANE FOAM PIPE BENDS #103	*	5	*	25Jan91	31Jan91	08Feb91	14Feb91 *	10
S	FS		261	BERM 3' BKFL OVER NEW PIPELINES #103	4		01Feb91	06Feb91	15Feb91	21Feb91	10	
P	FS		2245	RUN PIPE LINES TO VALVE PIT #105	20		11Jan91	L07Feb91	11Jan91	07Feb91	0	
*****	*****		P1165	URETHANE FOAM PIPE BENDS #105	*	5	*	08Feb91	14Feb91	08Feb91	14Feb91 *	0
S	FS		2615	BERM 3' BKFL OVER NEW PIPELINES #105	4		15Feb91	21Feb91	15Feb91	21Feb91	0	

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**GROUT VAULT PAIRS 102/103 & 104/105
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CT	REL	LAG	ACTIVITY NUMBER	DESCRIPTION	DURATION	EARLY TOTAL	EARLY REM.	LATE START	LATE FINISH	TOTAL FLOAT
P	FS		170	FR & P 4 EXCESS WTR PITS #102	15	28Aug90	L18Sep90	28Aug90	18Sep90	0
P	FS		174	FR & P VALVE PIT #102	12	28Aug90	13Sep90	31Aug90	18Sep90	3
*****	*****		P117	PAINT & ID MARKINGS #102	*	5	*	19Sep90	25Sep90	02Oct90
S	FS		210	BKFL 3' OVER ROOF CAP VAULT #102		4		09Oct90	12Oct90	08Oct90
S	FS		410	INSTL PIT COVER BLOCKS 102		2		26Sep90	27Sep90	12Oct90
								28Nov90	29Nov90	43
P	FS		1705	FR & P 4 EXCESS WTR PITS #104	15	15Nov90	L07Dec90	15Nov90	07Dec90	0
P	FS		1745	FR & P VALVE PIT #104	12	15Nov90	04Dec90	20Nov90	07Dec90	3
*****	*****		P1175	PAINT & ID MARKINGS #104	*	5	*	10Dec90	14Dec90	21Dec90
S	FS		2105	BKFL 3' OVER ROOF CAP VAULT #104		4		02Jan91	07Jan91	31Dec90
S	FS		4105	INSTL PIT COVER BLOCKS 104		2		17Dec90	18Dec90	07Jan91
								20Feb91	21Feb91	43
P	FS		172	FR & P 4 EXCESS WTR PITS #103	15	01Nov90	L21Nov90	01Nov90	21Nov90	0
P	FS		176	FR & P VALVE PIT #103	12	01Nov90	16Nov90	06Nov90	21Nov90	3
*****	*****		P118	PAINT & ID MARKINGS #103	*	5	*	26Nov90	30Nov90	07Dec90
S	FS		211	BKFL 3' OVER ROOF CAP VAULT #103		4		14Dec90	19Dec90	13Dec90
S	FS		411	INSTL PIT COVER BLOCKS 103		2		03Dec90	04Dec90	19Dec90
								20Feb91	21Feb91	53
P	FS		1725	FR & P 4 EXCESS WTR PITS #105	15	15Nov90	L07Dec90	15Nov90	07Dec90	0
P	FS		1765	FR & P VALVE PIT #105	12	15Nov90	04Dec90	20Nov90	07Dec90	3
*****	*****		P1185	PAINT & ID MARKINGS #105	*	5	*	10Dec90	14Dec90	31Dec90
S	FS		2115	BKFL 3' OVER ROOF CAP VAULT #105		4		02Jan91	07Jan91	07Jan91
S	FS		4115	INSTL PIT COVER BLOCKS 105		2		17Dec90	18Dec90	21Feb91
								20Feb91	21Feb91	43
P	FS		NA12	SUBMITTALS 03301 CONC 05500 METAL	22	10Aug89	L11Sep89	19Sep89	18Oct89	27
*****	*****		P119	DRAIN SEAL ASSEMBLY #102	*	20	*	12Sep89	09Oct89	27Nov90
S	FS		410	INSTL PIT COVER BLOCKS 102		2		26Sep90	27Sep90	* 284
								28Nov90	29Nov90	43
P	FS		S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	L13Nov89	28Nov89	11Jan90	38
*****	*****		P1195	DRAIN SEAL ASSEMBLY #104	*	20	*	14Nov89	13Dec89	19Feb91
S	FS		4105	INSTL PIT COVER BLOCKS 104		2		17Dec90	18Dec90	* 295
								20Feb91	21Feb91	43
P	FS		NA12	SUBMITTALS 03301 CONC 05500 METAL	22	10Aug89	L11Sep89	19Sep89	18Oct89	27
*****	*****		P120	DRAIN SEAL ASSEMBLY #103	*	20	*	12Sep89	09Oct89	19Feb91
S	FS		411	INSTL PIT COVER BLOCKS 103		2		03Dec90	04Dec90	* 340
								20Feb91	21Feb91	53
P	FS		S100	SUBMITTALS FOR VAULTS 104-105	30	03Oct89	L13Nov89	28Nov89	11Jan90	38
*****	*****		P1205	DRAIN SEAL ASSEMBLY #105	*	20	*	14Nov89	13Dec89	19Feb91
S	FS		4115	INSTL PIT COVER BLOCKS 105		2		17Dec90	18Dec90	* 295
								20Feb91	21Feb91	43

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CT	REL	LAG	ACTIVITY	DESCRIPTION	DURATION	EARLY	EARLY	LATE	LATE	TOTAL		
					TOTAL	REM.	START	FINISH	START	FINISH	FLOAT	
P	FS		P100	NOTICE TO PROCEED VAULTS 104 & 105	1		02Oct89	L02Oct89	27Nov89	27Nov89	38	
*****	*****		S100	SUBMITTALS FOR VAULTS 104-105	*	30	*	03Oct89	13Nov89	28Nov89	11Jan90 *	38
S	FS		0385	FR & P #104 CB SLAB & CRB		20		14Nov89	13Dec89	12Jan90	08Feb90	38
S	FS		0445	FR & P #105 CB SLAB & CRB		20		14Nov89	13Dec89	26Jan90	23Feb90	48
S	FS		055	FACTORY PREPARE LINERS 104/105		30		14Nov89	29Dec89	16Jan90	27Feb90	40
S	FS		1015	FR & P LEACHATE COLL. PIT FND #104		10		14Nov89	29Nov89	09Feb90	23Feb90	58
S	FS		1025	FR & P LEACHATE COLL. PIT FND #105		10		14Nov89	29Nov89	26Feb90	09Mar90	68
S	FS		2155	PREFAB PIPELINES 104/105		75		14Nov89	06Mar90	30Aug90	17Dec90	198
S	FS		NA115	DELIVER ELEC MATL 104/105		40		14Nov89	15Jan90	20Dec90	19Feb91	275
S	FS		NA75	FAB/DEL ROOF PANELS 104/105		22		14Nov89	15Dec89	02Oct90	31Oct90	220
S	FS		NA95	FAB/DEL LEACH. SUMP/RISER 104/105		40		14Nov89	15Jan90	12Jan90	09Mar90	38
S	FS		P1085	FAB PIT COVER BLOCKS #104		30		14Nov89	29Dec89	08Jan91	19Feb91	285
S	FS		P1095	FAB PIT COVER BLOCKS #105		30		14Nov89	29Dec89	08Jan91	19Feb91	285
S	FS		P1195	DRAIN SEAL ASSEMBLY #104		20		14Nov89	13Dec89	22Jan91	19Feb91	295
S	FS		P1205	DRAIN SEAL ASSEMBLY #105		20		14Nov89	13Dec89	22Jan91	19Feb91	295
P	FS		260	BERM 3' BKFL OVER NEW PIPELINES #102		4		26Nov90	L29Nov90	26Nov90	29Nov90	0
P	FS		410	INSTL PIT COVER BLOCKS 102		2		26Sep90	27Sep90	28Nov90	29Nov90	43
*****	*****		W02	WEATHER DELAY TIME #102	*	10	*	30Nov90	13Dec90	30Nov90	13Dec90 *	0
P	FS		261	BERM 3' BKFL OVER NEW PIPELINES #103		4		01Feb91	L06Feb91	15Feb91	21Feb91	10
P	FS		411	INSTL PIT COVER BLOCKS 103		2		03Dec90	04Dec90	20Feb91	21Feb91	53
*****	*****		W03	WEATHER DELAY TIME #103	*	10	*	07Feb91	21Feb91	22Feb91	07Mar91 *	10
S	FS		P110	COMPLETE KEH-5162 & DEMOBILIZE		30		08Mar91	18Apr91	08Mar91	18Apr91	0
P	FS		2605	BERM 3' BKFL OVER NEW PIPELINES #104		4		15Feb91	L21Feb91	15Feb91	21Feb91	0
P	FS		4105	INSTL PIT COVER BLOCKS 104		2		17Dec90	18Dec90	20Feb91	21Feb91	43
*****	*****		W04	WEATHER DELAY TIME #104	*	10	*	22Feb91	07Mar91	22Feb91	07Mar91 *	0
S	FS		P110	COMPLETE KEH-5162 & DEMOBILIZE		30		08Mar91	18Apr91	08Mar91	18Apr91	0
P	FS		2615	BERM 3' BKFL OVER NEW PIPELINES #105		4		15Feb91	L21Feb91	15Feb91	21Feb91	0
P	FS		4115	INSTL PIT COVER BLOCKS 105		2		17Dec90	18Dec90	20Feb91	21Feb91	43
*****	*****		W05	WEATHER DELAY TIME #105	*	10	*	22Feb91	07Mar91	22Feb91	07Mar91 *	0
S	FS		P110	COMPLETE KEH-5162 & DEMOBILIZE		30		08Mar91	18Apr91	08Mar91	18Apr91	0

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352

REQUEST FOR PROPOSAL NO.: KEH-5162 (B-714)
DATE OF ISSUE: May 5, 1989
DATE PROPOSAL DUE: June 2, 1989

May 25, 1989

ADDENDUM NO. 1

VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE
DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE,
RICHLAND, WASHINGTON

Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989 for subject work is hereby modified as follows:

1. CONSTRUCTION SPECIFICATION NO. B-714-C2, DIVISION 1

a. Section 01010

- (1) Paragraph 1.1.2: The paragraph is changed to read as follows:

"1.1.2 This Specification provides for construction of a pair of concrete vault structures shown on the Drawings (Vaults 102 and 103). This Specification shall also apply for construction of an additional pair of Concrete Vault Structures (Vaults 104 and 105)"
- (2) Paragraph 1.2.2.15: The paragraph is changed to read as follows:

"1.2.2.15 Furnish pipe bends with tees and prefabricated concrete pipe supports for tie-in at coordinate N40522/W45767. (Re: Drawing H-2-77611, Details 1 and 2.)"
- (3) Paragraph 1.2.2.16: The paragraph is changed to read as follows:

"1.2.2.16 Furnish pull wire and new sensing cable, for installation by others, from PP-10 and PP-11."
- (4) Paragraph 1.2.2.17: The paragraph is changed to read as follows:

"1.2.2.17 Work included but no detailed design is provided.
a. Project B-714 drawings and technical specifications indicate design for construction of Vault 102 and 103. Based upon this design, Contractor shall construct Vaults 104 and 105. Prior to construction of Vaults 104 and 105, KEH will provide design (drawings and technical information) which

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
PAGE 2, MAY 25, 1989

indicate the appropriate grades, elevations, coordinates, tag and equipment numbers, etc. The work of Vaults 104/105 is similar to Vaults 102/103.

b. Drawing H-2-77615, Zone E7 provides a plan view of piping to Vault 104/105. Install encased pipe from approximate coordinate N40450/W45768 to Vaults 104 and 105. Install encased pipe on coordinate N40265.5 from W45554 to W45458. Fab and install encased pipe similar to typical details for pipe to Vault 102/103.

c. Drawing H-2-77634 provides an electrical site plan for Vaults 101 through 105. Install electrical and instrumentation to Vault 104/105 as mirror image to Vault 102/103. Run electrical duct bank from MH-105A to coordinate W45430. Installation is similar to Vault 102/103 details.

d. Drawing H-2-77645 details a cathodic protection plan for piping. Provide an independent cathodic protection system similar to Vault 102/103 for pipe protection to Vault 104/105. Include rectifier and circuit breaker for tie-in at Panel D-PB-01."

- (5) Paragraph 1.2.2.18: Delete in its entirety.
- (6) Paragraph 1.2.3.2: The paragraph is changed to read as follows:

"1.2.3.2 Remove and reinstall sensing cable from PP-1 to PP-11."
- (7) Paragraph 1.3.1 through 1.3.1.3: The paragraphs are deleted in their entirety and the following substituted therefore:

"1.3.1 Sequence shall be in accordance with Section 01310."
- (8) Paragraph 1.3.2: The following is added:

"The written authorization shall be in addition to the Notice to Proceed with the individual phases."

b. Section 01019

Paragraphs 1.5.1.5 and 1.5.1.6 are added as follows:

"1.5.1.5 Short and long dowels (Ref. Dwg. H-2-77605, Sht 1).

1.5.1.6 Lifting bails (Ref. Dwgs. H-2-77605, Sht 1, Detail 2, and H-2-77597, Sht 1, Detail 6)."

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
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c. Section 01040

Paragraph 1.3.3.3: The first sentence of the paragraph is revised to read as follows:

"1.3.3.3 Excavation for future vaults 106 through 111 will be performed by others during 1990."

d. Section 01300

- (1) Paragraph 1.2.2: At the end of the paragraph add the following:

"SEPARATE SUBMITTALS ARE REQUIRED FOR EACH VAULT"

- (2) Page 01300-5: Add the following submittals for Review for Record, after PROGRESS SCHEDULES:

"QUALITY ASSURANCE

01400/1.2.1	Contractor's QAP	5	5 Working Days after Notice of Award"
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- (3) Page 01300-5: Under Leachate Collection Sump Liner add the following submittal:

"02750/3.2.1 Procedure for Disposal 10 15 days before
of hydrotest water testing"

- (4) Page 01300-10: Under Chemical Process Piping Systems add the following submittals:

"15493/3.1.5.2 Procedure for Disposal 10 15 days before
of flushing water flushing"

15493/3.2.3.2 Procedure for Disposal 10 15 days before
of Hydrotest Water testing"

e. Section 01310

- (1) Paragraph 1.4.1.3: The paragraph is changed to read as follows:

"1.4.1.3 Preliminary schedule allows 10 days of unusually severe weather delays to critical path activities. If unusually severe weather delays work on critical path activities notify KEH immediately."

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
PAGE 4, MAY 25, 1989

- (2) Paragraph 1.4.5: The last sentence of the paragraph is changed to read as follows:

"However, do not start activity until Notice to Proceed with that phase is issued."

- (3) Article 1.9 "Construction Milestones": The article is deleted in its entirety.

f. Section 01400

- (1) Article 1.2 is revised as follows:

"1.2 SUBMITTALS: Refer to 01300 for submittal procedures."

- (2) Add Paragraph 1.2.1 as follows:

"1.2.1 Submit finalized QAP which incorporates company name, personnel, and any other company specific information omitted during review of technical proposal. Provide in QAP any additional clarifications and/or revisions agreed upon by KEH during technical proposal review or Step 2 surveillance."

- (3) Paragraph 1.3.1.3 is revised as follows:

"1.3.1.3 Design Control (Not applicable to Contract KEH-5162 (B-714))."

- (4) Add Paragraph 1.4.2.11 as follows:

"1.4.2.11 DC overpotential test required in Section 16300, subparagraph 1.4.1.2."

- (5) Paragraph 1.4.3.1 b. The first sentence is revised as follows:

"b. H, R and W designations apply to each vault."

SAMPLE INDEMNITY AGREEMENT

The Sample Indemnity Agreement previously furnished is deleted and the enclosed Sample Indemnity Agreement, Revision 1, dated 5-22-89, is substituted therefor.

3. CONTRACT GENERAL CONDITIONS

a. Subsection 8.2, on Page 3

In the second line, "\$1,000,000" is changed to "\$2,000,000".

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
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b. Section 17

The following subsection is added:

"17.2 The following shall apply to Contract Price adjustments pursuant to the section of this Contract entitled "Changes" or any other section of this Contract when the amount of adjustment is \$25,000 or less.

17.2.1 The percentages for overhead, profit and commission will be fixed and automatically applied, unless KEH determines in its sole discretion that the automatic application of fixed percentages is inappropriate. Accordingly, KEH expressly reserves the right to negotiate such percentages for any particular adjustment prior to agreement thereon. Further, the utilization of fixed percentages for overhead, profit, and commission relative to a particular adjustment does not constitute a waiver of KEH's right to negotiate such percentages in future adjustments.

If the percentages for overhead, profit, and commission are to be fixed, they shall equal the values shown in the table at 17.2.2. If such percentages are to be negotiated, they shall be negotiated according to the nature, extent, and complexity of the work involved and shall not exceed the values shown in the table.

17.2.2 Table of percentages for overhead, profit, and commission, constituting either the maximum value allowable or the fixed value:

	<u>Overhead & Profit</u>	<u>Commission</u>
To Contractor on work performed by other than its own forces	--	5%
To first tier subcontractor on work performed by its subcontractors	--	5%
To Contractor and/or the subcontractors for that portion of the work performed with their respective forces		26.5%

17.2.3 Not more than three percentage markups (one overhead and profit and two commissions), either not exceeding or equal to the values shown, as applicable, will be applied to any portion of the total Price Adjustment regardless of the number of lower tier subcontractors.

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
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17.2.4 For adjustments that either increase or decrease the amount of the Contract, the application of the markup shall be on the net change in direct costs for the performance of changed work of the Contract.

17.2.5 When pricing adjustments, the following may not be considered, and will not be compensable, as direct costs: Job-site office expenses, incidental job burdens, small tools, general office overhead allocation, insurance premiums, and costs for estimating price of changed work."

c. Subsection 24.2

The following is inserted after the first sentence:

"In the event the Contractor is not authorized by KEH to complete all four phases of the Work (as defined in the Agreement), the final acceptance date for all phases of Work completed will be considered the date of final acceptance of the last phase completed."

4. SUPPLEMENTARY CONDITIONS

Attachment A to Supplementary Conditions is deleted in its entirety.

5. ADDITION OF REFERENCE DRAWING

Enclosed Drawing No. H-2-98800 is added to the reference drawings previously furnished (for information only).

6. SCHEDULE OF DRAWINGS

The following reference drawing is added after the last drawing listed on Page -8- of the Schedule of Drawings:

<u>Drawing Number</u>	<u>Title</u>	<u>Latest Rev. No.</u>
H-2-98800	Site Grading/Paving Plan	0"

7. ACCEPTANCE TEST PROCEDURE

Acceptance Test Procedure No. 4690 previously furnished is deleted in its entirety. The Schedule of Permits and Acceptance Test Procedures shall be revised accordingly.

ADDENDUM NO. 1 CONT.
REQUEST FOR PROPOSAL NO. KEH-5162 (B-714)
PAGE 7, MAY 25, 1989

8. LIST OF QUESTIONS AND ANSWERS AT PREPROPOSAL CONFERENCE

Enclosed for information and clarification purposes only is a list of significant questions asked and answers given at the "Preproposal Conference" held on May 17, 1989, together with a list of the prospective bidders who attended the site tour and conference.

Receipt of this addendum shall be acknowledged in writing and shall accompany your technical proposal. Failure to acknowledge receipt of this addendum may be cause for rejection of your technical proposal.

Technical Proposals (Quality Assurance Plans) will be received until 4:00 p.m., June 2, 1989, and then the technical evaluation process will begin.

M. A. Colby

M. A. Colby
Contract Administrator

MAC:mj

Enclosures: As stated

REQUEST FOR PROPOSAL
KEH-5162 (B-714)

VAULT CONCRETE BASIN, SHELL AND LEACHATE SUMP FOR
GROUTED WASTE DISPOSAL FACILITIES, 200-EAST AREA,
HANFORD SITE, RICHLAND, WASHINGTON

SIGNIFICANT QUESTIONS, ANSWERS AND GENERAL DISCUSSION AT THE PREPROPOSAL
SITE TOUR/CONFERENCE, MAY 17, 1989

QUALITY ASSURANCE

1. The following considerations regarding Quality Assurance were presented to the prospective bidders:
 - a. Step 1 of the two-step bidding process requires interested bidders to submit their proposed Quality Assurance Plan (QAP) for the subject contract work. The QAP must meet requirements of Article 1.3 of Section 01400 (titled Quality Assurance) contained in Division 1 of Specification No. B-714-C2.
 - o QAP must be a specific plan for subject contract.
 - o QAP must describe in sufficient detail the provisions for managing the required quality attributes for subject contract which may include supplemental implementing procedures and instructions.
 - o QAP shall adequately describe the management and interface with sub-contractors and suppliers.
 - o The requirements contained in Section 01400, Article 1.3 are based in part on ANSI/ASME NQA-1 1986 basic elements and other specific project criteria. Note that NQA-1 is not a part of the contract by reference. The requirements of 01400 contain the salient features of the required QAP. If contractor has an existing QA program based on national standards such as ANSI/ASME NQA-1 and will be used as a portion of the specific QAP, a matrix shall be provided which cross-references contractors proposed QAP with corresponding 01400 requirements.
 - b. 01400 requires that successful contractor employ a dedicated full-time quality assurance individual to be onsite whenever work is in progress.
 - c. 01400 contains summaries of the inspections/testing to be performed by contractor and KEH inspection and overview activities for acceptance.
 - d. 01400 contains specific Inspection and Witness points by specifications section including notification requirements.
 - e. 01400 contains information on KEH Open Item Deficiency and Nonconformance Reporting and applicable contractor responsibilities.

2. Question: Does the QAP need to address only the items spelled out in Specification Section 01400, Article 1.3?

Answer: That is correct. Article 1.3 contains the required salient features the specific QAP must address. However, Articles 1.4, 1.5 and 1.6 of Section 01400 and other specification sections contain information that should be considered in preparing a specific QAP for contract.

3. Question: What design is referred to in Paragraph 1.3.1.1, Section 01400?

Answer: Will clarify by addendum.

4. Question: Paragraph 1.4.1, Section 01400, contains an extensive list of contractors required inspections and tests. Is it required that all test procedures be included as part of QAP?

Answer: Not necessarily; however, QAP must indicate in sufficient detail the control of required inspections and tests. That may include procedures and instructions as part of QAP.

5. Question: Will the QA Plan judged acceptable in Step 1 of two-step process be the QA Plan we work to when job starts?

Answer: Yes. However, a final submittal of QAP will be required from successful bidder to add company logo, names of personnel, any clarifications during Step 1, etc.

6. Question: You mentioned the need to satisfy WHC and EPA quality assurance wise. Does this mean there will be QA requirements during construction in addition to what is called out in the specification now?

Answer: No. The contract documents, including Section 01400 of Division 1 and applicable sections of Divisions 2 through 16 contain all QA requirements for subject contract. (Contractors should be aware that Sections 02755 and 02756 of Division 2 do contain references to EPA documents.)

7. Question: Will QAP be accepted if Company name is in QA Plan?

Answer: Yes. However, we have requested that company names be left out of body of plan so that we can identify them to reviewers by number only.

8. Question: If proprietary information is in plan, how is it protected if name is taken off of plan?

Answer: Identify proprietary information on separate sheet. During review period, QAP will be provided to reviewers, only. When job is underway, the proprietary information in QAP will be used only as needed for job as provided in contract.

9. Question: Is the QAP required in Step 1 to include all phases of work?

Answer: Yes.

10. Question: To satisfy requirement for QAP, does contractor just have to rewrite and address requirement in Article 1.3, Section 01400?

Answer: QAP should describe in sufficient detail the provisions for managing the required quality attributes for subject contract. This includes a specific QAP to contract work and not a "parrot back" of 01400 requirements.

GENERAL QUESTIONS AND ANSWERS

11. Question: Only three phases of work are identified in Section 01310 of the specification but the Bid and Agreement forms indicate four phases. Are there four phases?

Answer: Yes. A revised Section 01310 will be furnished by Addendum and will show the construction activities for each of the four phases.

12. Question: Will all phases of work be funded?

Answer: it is anticipated that funds presently available will be sufficient for Phase 1 work and additional funds will be available when required to allow other phases of work to proceed as scheduled. However, no guarantee is made that funds will be available when required and, if not, contractor will complete work only on those phases for which NTP is received.

13. Question: If we produce all concrete aggregates required for all phases and work is not continued past Phase 1, can we use aggregates elsewhere on plant?

Answer: No, unless notified otherwise by addendum. NTP for Phase 1 will be applicable only for work of Phase 1.

14. Question: We did not receive all drawings listed on the Drawing List - are we missing some?

Answer: Some of the drawings on the Drawing List (Drawing No. H-2-77573) are not required. Drawings applicable to the contract work are listed in the Schedule of Drawings and are divided into "Construction Drawings" and "Reference Drawings (For information only)". One roll and one box of drawings were furnished. Most of the construction drawings are in the roll; however, a few are folded and in the box with the reference drawings.

15. Question: Section 03301, Par. 1.4.3.2, a., calls for aggregates to be stored on areas covered w/wood planks, sheet metal, or other hard and clean surface. Would compacted graded ground be considered "hard and clean surface"?

Answer: No.

16. Question: Are the insulated forms/curing blankets called out in Section 03301, Paragraph 3.2.9.7 required just during cold weather or all times of year?

Answer: All times of year.

17. Question: Is pit for concrete aggregates identified yet?

Answer: Paragraph 1.4.1 of Section 01019 indicates that pit will be within 6 miles of project site. We plan to identify available pits by addendum. (KEH does not warrant that such pits will yield material suitable for concrete aggregates.)

KEH-5162 (B-714)

VAULT CONCRETE BASIN, SHELL AND LEACHATE SUMP FOR
GROUTED WASTE DISPOSAL FACILITIES, 200-EAST AREA
HANFORD SITE, RICHLAND, WASHINGTON

SITE TOUR/PRE-BID CONFERENCE
MAY 17, 1989, 8:30 A.M.

NAME OF ATTENDEE	COMPANY REPRESENTED	TELEPHONE NO.
Dennis Abraham	J-I-J Construction Co., Inc.	(206)366-5050
Ernest K. Farley	Ebasco Services Incorporated	(714)662-4055
Larry A. Stinson	Ebasco Services Incorporated	(509)943-0550
Donald G. Sundeen	Ebasco Services Incorporated	(509)943-0550
Joseph M. Levernier	Levernier Construction, Inc.	(509)927-3000
Gary B. DeWater	Pacific Erectors, Inc.	(206)838-1444
Robert D. Askins	Max J. Kuney Company	(509)535-0651
Charles P. McFarlane	Central Pre-Mix	(509)534-6221
Craig A. Mayfield	Central Pre-Mix	(509)534-6221
David M. Banke	David A. Mowat Company	(206)747-7393
William B. Mallory	J. A. Jones Construction Co.	(704)553-3000
James J. Flannery	J. A. Jones Construction Co.	(704)553-3000
Bruce Hallgarth	Roebbelin Engineering, Inc.	(916)355-8500
James D. Jansen	Gilbert H. Moen Co.	(509)248-0740
John S. Turner	Morgen & Oswood Construction	(406)761-1420
Richard W. Richter	George A. Grant, Inc.	(509)946-6188
Bruce Mackebon	Bruce-Cadet, Inc.	(509)783-4207

SAMPLE

INDEMNITY AGREEMENT

The undersigned authorized representatives of Kaiser Engineers Hanford Company and the Contractor hereby acknowledge that they have read and understood the terms and conditions of the Indemnity Agreement set forth below, and agree to be bound by these terms and conditions including any subsequent modifications thereto.

INDEMNITY

Contractor agrees to defend, indemnify and hold harmless KEH and Westinghouse Hanford Company and their agents and employees, from and against any claim, costs, expense or liability (including attorneys' fees), attributable to bodily injury, sickness, disease or death, or to damage to or destruction of property (including loss of use thereof), caused by, arising out of, resulting from or occurring in connection with the performance of the Work by Contractor, its subcontractors, or their agents or employees, whether or not caused in part by the active or passive negligence or other fault of a party indemnified hereunder; provided, however, Contractor's duty to indemnify hereunder shall not arise if such injury, sickness, disease, death, damage or destruction is caused by the sole negligence of a party indemnified hereunder; and further provided, that the amount of such indemnification shall be limited to an amount equal to indemnitor's percentage of fault. Such percentage of fault shall not reduce the Contractor's obligation to pay attorney's fees as provided above. Contractor also agrees to reimburse any party indemnified hereunder for all costs (including attorneys' fees) incurred to enforce this Indemnity Agreement.

Contractor specifically and expressly waives any immunity that may be granted it under the Washington State Industrial Act, Title 51 of the Revised Code of Washington, et. seq. Contractor's obligation hereunder shall not be limited by the provisions of Title 51 of the Revised Code of Washington et. seq. or any other industrial insurance, worker's compensation or similar act.

Should any person assert a claim or institute a suit, action, or proceeding against a party indemnified hereunder involving the manner or sufficiency of the performance of the Work, Contractor shall, upon request of such indemnified party, promptly assume the defense of such claim, suit, action or proceeding, at Contractor's expense, and Contractor shall indemnify and hold harmless such indemnitee and its agents and employees, from and against any liability, loss, damage, or expense (including attorneys' fees) arising out of or related to such claim, suit, action or proceeding.

page two
Indemnity Agreement

Contractor shall provide and maintain insurance covering its obligation under this Indemnity Agreement. The insurance shall be in accordance with Section 8, Insurance, of the Contract General Conditions. The parties indemnified hereunder agree to look solely to the insurance in the event of a claim hereunder. However, if the Contractor fails to provide or maintain the required insurance coverage or if the insurance company fails, for whatever reason, to honor the claim, the Contractor shall be fully and individually liable without limit.

THIS INDEMNITY AGREEMENT WAS SPECIFICALLY NEGOTIATED BY AND BETWEEN THE PARTIES HERETO.

CONTRACT NO.

BY:

BY:

NAME, TITLE

NAME, TITLE

DATE: _____

DATE: _____

FOR:

FOR:

FIRM (CONTRACTOR)

KAIser ENGINEERS HANFORD COMPANY

ADDRESS

P. O. BOX 888
RICHLAND, WASHINGTON 99352

TELEPHONE NUMBER

Rev. 1
May 22, 1989

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352

REQUEST FOR PROPOSAL NO.: KEH-5162 (B-714)

DATE OF ISSUE: May 5, 1989

DATE PROPOSALS RECEIVED: June 2, 1989

ISSUE INVITATION FOR BID (TO THOSE WITH

ACCEPTABLE PROPOSALS): June 16, 1989

DATE BIDS DUE: June 30, 1989

June 9, 1989

ADDENDUM NO. 2

**VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE
DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE,
RICHLAND, WASHINGTON**

Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989 for subject work is hereby modified as follows:

CONSTRUCTION SPECIFICATION NO. B-714-C2, DIVISION 1

1. Section 01310, Paragraphs 1.3.3.1 through 1.3.3.4

The paragraphs are changed to read as follows:

"1.3.3.1 Phase I Activities

- a. Payment and Performance Bonds.
- b. Mobilization.
- c. Submittals.
- d. Produce gravel diffusion material for installation under Catch Basin for Vaults 102, 103, 104 and 105.
- e. Furnish HDPE liners, geotextiles and drainage nets for Vaults 102 and 103.
- f. Furnish leachate collection sump liner and riser for Vaults 102 and 103.
- g. Foundation excavation for Vaults 102, 103, 104 and 105.
- h. Place diffusion barrier and asphalt overlay under catch basin for Vaults 102, 103, 104 and 105.
- i. Form, install reinforcing steel, and place concrete for leachate sump foundation for Vaults 102 and 103.
- j. Place leachate sump and 4-inch catch basin drainage pipe and encase in concrete for Vaults 102 and 103.
- k. Form, install reinforcing steel and place concrete for catch basin for Vault 102.
- l. Form, install reinforcing steel and place concrete for catch basin for Vault 103.
- m. Install liner, geotextile, 4-inch perforated pipe and gravel for Vaults 102 and 103.
- n. Form, install reinforcing steel, and place concrete for floor of Vault 102.

ADDENDUM NO. 2 CONT.
Request for Proposal No. KEH-5162 (B-714)
Page 2 - June 9, 1989

1.3.3.2 Phase II Activities

- a. Furnish HDPE liners, geotextiles and drainage nets for Vaults 104 and 105.
- b. Furnish leachate collection sump liner and riser for Vaults 104 and 105.
- c. Form, install reinforcing steel, and place concrete for leachate sump foundation for Vaults 104 and 105.
- d. Place leachate sump and 4-inch catch basin drainage pipe and encase in concrete for Vaults 104 and 105.
- e. Form, install reinforcing steel and place concrete for catch basin for Vault 104.
- f. Form, install reinforcing steel, and place concrete for catch basin for Vault 105.
- g. Install liner, geotextile, 4-inch perforated pipe, and gravel for Vaults 104 and 105.
- h. Form, install reinforcing steel, and place concrete for floor of Vault 103.
- i. Form, install reinforcing steel, and place concrete for floor of Vault 104.
- j. Form, install reinforcing steel, and place concrete for floor of Vault 105.
- k. Form, install reinforcing steel, and place concrete for walls of Vault 102.
- l. Form, install reinforcing steel, and place concrete for walls of Vault 103.

1.3.3.3 Phase III Activities

- a. Form, install reinforcing steel, and place concrete for walls of Vault 104.
- b. Form, install reinforcing steel, and place concrete for walls of Vault 105.
- c. Apply asphalt coating to interior of Vaults 102, 103, 104 and 105.
- d. Install exterior drainage path for Vaults 102, 103, 104 and 105.
- e. Produce gravel diffusion material necessary to complete backfill to elevation 650.5 for Vaults 102, 103, 104 and 105.
- f. Place diffusion barrier and backfill around Vault 102 and 1 side of Vault 103 to top of walls.
- g. Place diffusion barrier and backfill around Vault 103 and 1 side of Vault 104 to top of walls.
- h. Furnish precast prestressed concrete cover blocks for Vaults 102 and 103.
- i. Set precast, prestressed concrete cover blocks for Vaults 102 and 103.

ADDENDUM NO. 2 CONT.

Request for Proposal No. KEH-5162 (B-714)
Page 3 - June 9, 1989

- j. Form, install reinforcing steel and place concrete for 4 excess water pits, vault pit and leachate pit for Vaults 102 and 103.
- k. Place concrete topping over cover block of Vaults 102 and 103.
- l. Perform air leakage test on Vaults 102 and 103.
- m. Install roof penetration risers for Vaults 102 and 103.
- n. Produce gravel diffusion material for completion of all backfill on Vaults 102, 103, 104 and 105.
- o. Place 3 feet of diffusion barrier and temporary protective geotextile over roofs of Vaults 102 and 103.
- p. Furnish prefabricated pipe spools for piping to and over Vaults 102 and 103.
- q. Furnish prefabricated pipe spools for piping to and over Vaults 104 and 105.
- r. Install encased grout feed and excess water pipe lines from tie-in point to Vault pit for Vaults 102 and 103 including piping extension to future vaults.
- s. Install encased excess water pipe over vault from Vault pit to 4 excess water pits and leachate collection pit to excess water pit for Vaults 102 and 103.
- t. Furnish electrical and instrumentation materials required to complete Vaults 102 and 103. Include electrical distribution transformer at Vault 102 and cathodic protection materials for TGE and Vaults 101, 102, and 103.
- u. Complete installation of cathodic protection for pipe at TGE and Vault 101.
- v. Install cathodic protection for pipe to Vault 102/103 including piping extension for future vaults.
- w. Install power pole, transformers, and electrical service to Manhole 104.
- x. Install electrical service and equipment to Manhole 102A and Vault 102. Include 225 KVA distribution transformer.
- y. Install electrical service and equipment to Manhole 103A and Vault 103.
- z. Furnish electrical and instrumentation materials required to complete Vaults 104 and 105. Include cathodic protection materials for Vault 104/105.
- aa. Install instrumentation for Vaults 102 and 103.
- bb. Apply special protective coatings and identification markings to Vault 102 and 103.
- cc. Fabricate and install cast-in-place cover blocks for excess water pits, leachate collection pit and vault pit for Vaults 102, 103, 104 and 105.
- dd. Fabricate and install drain seal assemblies, T-handle plugs and guard rails for Vaults 102 and 103.
- ee. Furnish precast prestressed concrete cover blocks for Vaults 104 and 105.

ADDENDUM NO. 2 CONT.

Request for Proposal No. KEH-5162 (B-714)

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1.3.3.4 PHASE IV ACTIVITIES

- a. Place diffusion barrier and backfill around Vaults 104 and 105 to top of walls.
- b. Set precast, prestressed concrete cover blocks for Vaults 104 and 105.
- c. Form, install reinforcing steel and place concrete for 4 excess water pits, vault pit and leachate pit for Vaults 104 and 105.
- d. Place concrete topping over cover block of Vaults 104 and 105.
- e. Perform air leakage test on Vaults 104 and 105.
- f. Install roof penetration risers for Vaults 104 and 105.
- g. Place 3 feet of diffusion barrier and temporary protective geotextile over roofs of Vaults 104 and 105.
- h. Install encased grout feed and excess water pipe lines from tie-in point to Vault pit for Vaults 104 and 105 including piping extension to future vaults.
- i. Install encased excess water pipe over vault from vault pit to excess water pits and leachate collection pit to excess water pit for Vaults 104 and 105.
- j. Install cathodic protection for pipe to Vault 104/105 including piping extension for future vaults.
- k. Install electrical service and equipment from Manhole 105A to Vault 105 and Manhole 103A to Vault 104.
- l. Install instrumentation for Vaults 104 and 105.
- m. Apply special protective coatings and identification markings to Vaults 104 and 105.
- n. Fabricate and install drain seal assemblies, T-handle plugs and guard rails for Vaults 104 and 105.
- o. Deliver project record documents for Vaults 102, 103, 104 and 105.
- p. Demobilize."

2. Section 01400, Article 1.7

The Article is deleted in its entirety and replaced with the following:

"1.7 SCHEDULE OF HOLD, RECEIVING, AND WITNESS POINTS

SITEWORK

Diffusion Barrier

- Off-Site*
- H - Initial coating of gravel for diffusion barrier for the following areas:
 - a. Under concrete basin
 - b. Adjacent to vault/basin walls

ADDENDUM NO. 2 CONT.

Request for Proposal No. KEH-5162 (B-714)
Page 5 - June 9, 1989

- c. On top of vault roof
- d. Miscellaneous areas

- On-Site
- H - All compaction demonstrations
- H - All backfill operations
- H - All placement of coated gravel

Earthwork

- H - All compaction procedure demonstrations
- H - All backfill operations

Hot-Laid Asphaltic Concrete Pavement

- Off-Site
- H - Initial batching of hot-laid asphaltic concrete
- On-Site
- H - All placement of hot-laid asphaltic concrete

Leachate Collection Sump Liner

- Off-Site*
- H - Initial welding
- W - Initial dye penetrant examination of welds
- H - All completed fabrication prior to release for shipping
- On-Site
- R - Arrival of sump liner
- R - Arrival of steel riser pipe
- R - Arrival of filler material
- H - Initial welding/bolting
- W - Initial dye penetrant examination
- H - All hydrostatic testing
- W - All Holiday testing
- H - Initial installation of riser
- W - Final installation of riser
- H - Initial installation of polypropylene pipe
- H - Initial bonding of polypropylene pipe

Exterior Drainage Path

- R - Arrival of material
- H - Initial installation of membranes
- H - All repair and replacement of membrane

ADDENDUM NO. 2 CONT.
Request for Proposal No. KEH-5162 (B-714)
Page 6 - June 9, 1989

Waste Disposal Basin Liners

- Off-Site*
 - H - Initial manufacturing of liner
 - H - All manufactured material sampling
 - H - Initial crating of the liner

- On-Site
 - R - Arrival of liner on-site
 - W - All basin liner unrolling
 - W - Initial leachate collection pipe installation
 - H - Initial joint preparation of liner prior to weld
 - H - Initial welding (bonding) of FML liner
 - W - Initial installation of liner
 - H - Prior to removal of weld seams for destructive testing
 - H - All FML liner repairs
 - W - Initial permanent anchoring of FML liner
 - H - All testing of extrusion/fusion welds and repairs

Leachate Collection System

- R - Arrival of gravel
- R - Arrival of geotextile material
- R - Arrival of leachate collection pipe
- H - Initial unrolling of geotextile
- W - Initial installation of geotextile
- W - Initial temporary anchoring
- H - Initial installation of perforated pipe
- W - All backfilling for leachate drainage gravel
- W - All compaction of leachate drainage gravel

CONCRETE

Cast-In-Place Concrete

- H - All concrete placements
- W - All concrete repair
- H - Prior to mixing all grout

Vault and Basin Cast-In-Place Concrete

- Off-Site* or On-Site
 - H - Initial batching of production concrete

- On-Site
 - R - Arrival of rebar
 - H - Initial rebar splice and/or welding
 - W - Initial installation of embedded items
 - H - Initial waterstop welding
 - H - All concrete placement

ADDENDUM NO. 2 CONT.
Request for Proposal No. KEH-5162 (B-714)
Page 7 - June 9, 1989

- H - All hydrostatic testing
- H - All air leakage testing

Pre-Cast Pre-Stressed Concrete Sections

- Off-Site*
- H - Initial fabrication
- H - Initial welding of rebar (splicing)
- H - Initial concrete placement

- On-Site
- R - Arrival of pre-cast sections
- W - All installations of pre-cast sections

METALS

Metal Fabrications

- W - Initial welding
- W - Initial metal fabrication installations

FINISHES

Special Protective Coating

- R - Receipt of coating materials
- H - Initial priming
- H - Initial coating application

Protective Coating For Concrete Vault Interior

- R - Receipt of coating material
- H - Initial priming
- H - Initial application of second coat
- H - Initial application of final coat
- H - All repairs

SPECIAL CONSTRUCTION

Instrumentation

- R - Arrival of instrumentation assemblies
- W - Initial instrumentation installation
- H - All electrical testing
- H - Initial welding of thermocouple tree to flange

ADDENDUM NO. 2 CONT.
Request for Proposal No. KEH-5162 (B-714)
Page 8 - June 9, 1989

MECHANICAL

Chemical Process Piping System

- Off-Site*
 - H - Initial welding
 - H - Initial nondestructive testing
 - W - All pipe cleaning
 - W - All flushing
 - H - All leak pressure testing

- On-Site
 - W - All pipe cleaning
 - R - Arrival of piping spools
 - H - Initial welding
 - H - All fit-up inspection (tie-in welds)
 - H - All root pass welding (tie-in welds)
 - W - All flushing
 - H - Initial nondestructive testing
 - H - All leak/pressure testing
 - W - All Holiday testing
 - W - All polyurethane foam applications

ELECTRICAL

High Voltage Distribution (Above 600 Volt)

- R - Arrival of cables
- R - Arrival of equipment
- W - All electrical splicing
- W - Initial underground installation of duct banks
- H - All electrical testing

Service and Distribution (600-Volt and Below)

- R - Arrival of equipment enclosures and annunciators
- W - All splicing
- H - All electrical testing of cables and wires
- W - Initial exothermic welding of ground grid
- H - Final closure of all electrical enclosures

Cathodic Protection

- R - Arrival of all equipment
- H - Initial exothermic welding
- W - Initial installation of equipment and enclosures
- H - All electrical testing
- H - Final closure of all electrical enclosures

*Off-site requires 3 working days notification"

ADDENDUM NO. 2 CONT.

Request for Proposal No. KEH-5162 (B-714)
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Technical Proposals (Quality Assurance Plans) are presently being evaluated.
Invitation for Bid will be issued on or about June 16, 1989 to those firms
whose proposals are acceptable.

Receipt of this addendum shall be acknowledged on the Bid Form in the
space provided therefor. Failure to acknowledge receipt of all addenda
may be cause for rejection of your bid.

KAISER ENGINEERS HANFORD COMPANY

M. A. Colby

M. A. Colby
Contract Administrator

MAC:mj

(ECN B-714-9)

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352

REQUEST FOR PROPOSAL NO.: KEH-5162 (B-714)

DATE OF ISSUE: May 5, 1989

DATE PROPOSALS RECEIVED: June 2, 1989

ISSUE INVITATION FOR BID TO THOSE WITH

ACCEPTABLE PROPOSALS (REVISED DATE): June 22, 1989

DATE BIDS DUE (REVISED DATE): July 7, 1989

June 15, 1989

ADDENDUM NO. 3

**VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE
DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE,
RICHLAND, WASHINGTON**

Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989 for subject work is hereby modified as follows:

1. ADDEMDUM NO. 1, DATED MAY 25, 1989, PARAGRAPH 1., a., (4), d. ON PAGE 2

The last sentence is changed to read as follows:

"Include new rectifier and circuit breaker for tie-in at Panel D-PB-01."

2. CONSTRUCTION SPECIFICATION NO. B-714-C2, DIVISION 1

- a. Section 01019

The following paragraphs are added after paragraph 1.4.5.8:

"1.4.6 If Contractor elects to set-up an onsite concrete batch plant he shall locate temporary facility at Pit 28 or Pit 30.

1.4.6.1 Access to Pit 28 or Pit 30 and travel between batch plant and construction site shall be on roads designated by KEH and use shall be in accordance with Section 01500.

1.4.6.2 Location of Pit 28 is approximately 6.2 road miles from the construction site.

1.4.6.2.1 Electrical power for operating the batch plant would be available from an existing overhead 13.8 KV transmission line approximately 1 mile north of Pit 28. The Contractor to furnish power lines or cable extensions, including load centers, transformers, protective equipment, disconnect switches, and fixtures for AC power from existing 13.8 KV line to batch plant site (Pit 28).

ADDENDUM NO. 3 CONT.

Request for Proposal No. KEH-5162 (B-714)
Page 2 - June 15, 1989

1.4.6.2.2 Raw water is available from an existing buried 10" ductile iron pipe line. The pipe line is located approximately 1 mile north of Pit 28. Routing of temporary water line will require crossing a two-lane road. The Contractor to furnish hauling, dispensing, temporary piping and fittings approved by KEH for connection to water source. There is no potable water available at or near Pit 28.

1.4.6.3 Location of Pit 30 is approximately 5 road miles from the construction site.

1.4.6.3.1 Electrical power for operating the Batch plant would be available from an existing overhead 13.8 KV transmission line approximately 450 yards south of Pit 30. The Contractor to furnish power lines or cable extensions, including load centers, transformers, protective equipment, disconnect switches, and fixtures for AC power from existing 13.8 KV line to batch plant site (Pit 30).

1.4.6.3.2 Potable water is available from an existing buried 8" PVC pipe line. The pipe line is located approximately 1/2 mile south of Pit 30. Routing of temporary water line will require crossing Route 4 (a two-lane road) and an elevated 24" steam line. The Contractor to furnish hauling, dispensing, temporary piping and fittings approved by KEH for connection to water source."

b. Section 01100, Subparagraph 1.5.3

The second sentence is deleted and the following substituted therefor:

"The Contractor shall establish and maintain a log of the waste placed in each barrel. The log should include the type, amount, date, and person who placed the waste in the barrel. Also, there should be a separate log for each barrel, and hazardous wastes shall not be mixed."

c. Section 01500, Subparagraph 1.4.1.3, j.

The following is added at the end of the subparagraph:

"Prior to disposal of hydrotest water, the water used in the hydrostatic testing shall be analyzed (by others) for hazardous contamination prior to dumping into the storm sewer. If analysis shows hazardous contamination, an alternative waste plan will be implemented and approved by KEH."

3. CONSTRUCTION SPECIFICATION NO. B-714-C2, DIVISION 2, SECTION 02145

The section previously furnished is deleted in its entirety and the enclosed Section 02145, Revision 1, dated 5-31-89, is substituted therefor.

ADDENDUM NO. 3 CONT.

Request for Proposal No. KEH-5162 (B-714)

Page 3 - June 15, 1989

4. PRELIMINARY CPM SCHEDULE FOR CONSTRUCTION OF VAULTS 102 THROUGH 105

The enclosed sheets (1 through 9) entitled "KEH-5162 (B-714) Phase Activities vs CPM Activities" dated June 5, 1989, are to be inserted under the cover sheet of the Preliminary CPM Schedule previously furnished.

5. SUPPLEMENTARY CONDITIONS

Part 3 is deleted in its entirety.

Technical Proposals (Quality Assurance Plans) are presently being evaluated. Invitation for Bid will be issued on or about June 22, 1989 to those firms whose proposals are acceptable.

Receipt of this addendum shall be acknowledged on the Bid Form in the space provided therefor. Failure to acknowledge receipt of all addenda may be cause for rejection of your bid.

KAISER ENGINEERS HANFORD COMPANY



M. A. CoTby
Contract Administrator

MAC:mj

(ECN B-714-8 & B-714-11)

SECTION 02145
DIFFUSION BARRIER

PART 1 - GENERAL**1.1 REFERENCES**

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

C 294-86	Standard Descriptive Nomenclature for Constituents of Natural Mineral Aggregates
C 295-85	Standard Practice for Petrographic Examination of Aggregates for Concrete
D 1117-80	Standard Methods of Testing Nonwoven Fabrics
D 1664-80	Standard Test Method for Coating and Stripping of Bitumen-Aggregate Mixtures
D 1682-64 (1975)	Standard Test Methods for Breaking Load and Elongation of Textile Fabrics
D 1777-64 (1975)	Standard Method for Measuring Thickness for Textile Materials
D 3776-85	Standard Test Methods for Mass Per Unit Area (Weight) of Woven Fabric
D 3787-80a	Standard Test Method for Bursting Strength of Knitted Goods-- Constant-Rate-of-Traverse (CRT) Ball Burst Test
D 4491-85	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
E 11-87	Standard Specification for Wire-Cloth Sieves for Testing Purposes

1.1.1.2 Washington State Department of Transportation (WSDOT)**M41-10-88****Standard Specification for
Road, Bridge, and Municipal
Construction****1.2 SUBMITTALS:** Refer to Section 01300 for submittal procedures.**1.2.1 Laboratory Reports:** Submit reports from independent laboratory showing following.**1.2.1.1** Proposed aggregate source will produce gravel classified as igneous or metamorphic rock in accordance with ASTM C 294. Examine aggregate in accordance with ASTM C 295.**1.2.1.2** Aggregate meets the requirements of Paragraph 2.1.1.**1.2.1.3** Liquid asphalt meeting the following requirements.

a. MC-250 in accordance with WSDOT M41-10, Section 9-02.1(2).

b. AR-4000W in accordance with WSDOT M41-10, Section 9-02.1(4).

1.2.2 Manufacturer's Data: Provide data defining physical properties of geotextile filtration and reinforcing fabrics to be supplied. As minimum, properties shall meet requirements of specified ASTM standards listed in Paragraph 2.1.3.**1.2.3 Handling Procedure:** Submit proposed procedure that defines methods used for delivery, storage, and handling to ensure requirements of Paragraphs 1.3.1 and 3.3.1 are met. Include method for keeping coated gravel free of dirt or foreign material.**1.2.4 Placing Procedure:** Submit proposed procedure that defines methods used during placing and spreading to ensure requirements of Paragraph 3.3.1 are met. Include method for keeping coated gravel free of dirt or foreign material, and type and size of equipment used.**1.2.5 Compacting Procedures:** Submit proposed procedures for compacting, including type and size of equipment. Include 3 separate procedures for placement under concrete basin, adjacent to vault walls, and over vault roof.**1.2.6 Geotextile Installation Procedure:** Submit proposed procedure for installation of geotextile as shown on the Drawings. Include placement and removal techniques of temporary protective geotextile to minimize contamination of coated gravel.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Diffusion Barrier

1.3.1.1 Construct stockpiles in accordance with WSDOT M41-10, Section 3-02.2(6).

1.3.1.2 Place stockpiles of coated gravel on asphalt or concrete surface, free of dirt and debris.

1.3.1.3 Cover stockpiles with suitable covers or tarps approved by KEH when not in use, at end of each shift, or when average wind speed at Hanford weather station exceeds 25 mph or peak gusts exceed 40 mph.

1.3.1.4 Remove coated gravel from stockpiles in accordance with WSDOT M41-10, Section 3-02.2(7).

1.3.1.5 Hauling equipment shall meet the requirements of WSDOT M41-10, Section 5-04.3(2) with additional requirement that coated gravel shall be covered during transportation.

1.3.2 Geotextile: Handle and store in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Aggregate: Composed of crushed stone or gravel aggregates classified in ASTM C 294 as either igneous or metamorphic rocks, and meeting following requirements.

2.1.1.1 Aggregate production: In accordance with WSDOT M41-10, Section 3-01.

2.1.1.2 Grading and quality

a. Amounts finer than each laboratory sieve (square-openings), weight percent.

Nominal Square Opening Sieve Size	Percent
1 in.	100
3/4 in.	50 to 90
1/2 in.	20 to 55
3/8 in.	5 to 15
No. 4	0 to 5
No. 200	0 to 1

b. Deleterious materials: Particles of specific gravity less than 1.95, maximum 1 percent by weight.

c. Limits for fractured faces by percent weight: Minimum of 2 fractured faces on 75 percent and least 1 fractured face of 90 percent of material retained on 3/8 inch and above sieves, as determined by WSDOT Test Method No. 103.

2.1.2 Asphalt meeting the following requirements.

2.1.2.1 WSDOT M41-10, Section 9-02.1(2) for MC-250 liquid asphalt.

2.1.2.2 WSDOT M41-10, Section 9-02.1(4) for AR-4000W liquid asphalt.

2.1.3 Anti-stripping additive: Meet the requirements of WSDOT 9-02.4 except percent of additive used and requirement for use shall be determined by contractor based on ASTM D 1664 for each aggregate source.

2.1.4 Nonwoven Geotextile: Long-chain synthetic polymer with stabilizers and inhibitors added to base plastic to make filaments resistant to deterioration due to ultraviolet and heat exposure. Geotextile shall meet following requirements.

<u>Property</u>	<u>Test Method</u>	<u>Values</u>
Fabric Weight (oz/sq yd)	ASTM D 3776	10
Thickness (mil)	ASTM D 1777	100
Grab Tensile Strength (lbs, min)	ASTM D 1682	300
Grab Elongation (%, min)	ASTM D 1682	30 in any principal direction
Coefficient of Water Permeability (cm/sec)	ASTM D 4491	0.5
Puncture Strength (lbs, min)	ASTM D 3787	100
Tear Strength (lbs, min trapezoidal)	ASTM D 1117	100 in any principal direction
Equivalent Opening Size (EOS), US Sieve	----	70-100 in accordance with ASTM E 11
Minimum Width (ft)	----	12

2.2 MIXES

2.2.1 Proportions

2.2.1.1 Size, grade, and quantity of materials, when proportioned and mixed shall produce mixture meeting following requirements.

a. Percentage of asphalt: Range from 1 to 2.5 percent by weight of total asphalt mixture.

2.2.2 Mixing

a. Asphalt mixing plants: Meet the requirements of WSDOT M41-10, Section 5-04.3(1).

b. Remove aggregates from stockpiles in manner to ensure minimum segregation when being moved to plant for processing into final mixture.

c. Heat aggregates to minimum of 150 to maximum 200 F for MC-250 and minimum 260 to maximum 285 F for AR 4000.

d. Anti-stripping additive: Add to MC-250 mix if aggregate coating does not meet the 95 percent minimum coverage as determined by ASTM D 1664.

e. The quantity of asphalt material shall not be reduced by the quantity of anti-stripping additive.

f. Heat MC-250 asphalt to minimum 175 and maximum 225 F. Heat AR4000 asphalt to minimum 225 and maximum 350 F. Heat in manner to avoid local overheating and provide continuous supply of material to mixer.

g. Wet mixing time: Sufficient to produce 95 percent coated particles as determined by WSDOT Test Method No. 714.

h. Mix temperature shall not exceed 325 F.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Geotextile

3.1.1.1 Before work is started examine sheet rolls for damage from transit and storage. If damaged set aside and do not use.

3.1.1.2 During unrolling of material, visually examine surfaces. Do not use material showing defects or damage. Cut out and replace or patch defective or damaged areas.

3.2 PREPARATION

3.2.1 Subgrade: Prepare subgrade in accordance with Section 02200, Paragraph 3.2.6, within 3 weeks before placing diffusion barrier.

3.3 INSTALLATION

3.3.1 Diffusion Barrier

3.3.1.1 Before placement demonstrate to KEH, by trial placement at site, procedure proposed for placing and compacting diffusion barrier. Prepare "Soil Compaction Procedure" Form KEH-382, sample appended, in accordance with printed instructions, for following areas. Forms will be furnished by KEH.

- a. Under concrete.
- b. Adjacent to vault/basin walls.
- c. On top of vault roof.
- d. Other areas requiring hand tampers or small compaction equipment.

3.3.1.2 Keep surrounding area free of dust by watering during placing operation.

3.3.1.3 Stop placing and cover diffusion barrier gravel when average wind speed at Hanford weather station exceeds 25 MPH or peak gusts exceed 40 MPH.

3.3.1.4 Cover diffusion barrier at end of each shift, or when placement or compaction is not in progress.

3.3.1.5 Clean equipment used for hauling, placing, spreading, and compacting of dirt or gravel before handling diffusion barrier material.

3.3.1.6 Conveyors or other equipment used for placement shall not produce segregation.

3.3.1.7 Maximum placement temperature of coated gravel: 175 F when placing against exterior drainage path.

3.3.1.8 Hauling equipment shall not be allowed to be driven on diffusion barrier unless thoroughly cleaned.

3.3.1.9 Place coated gravel in layers not to exceed 6 inches loose measurement. Compact areas inaccessible to large compacting equipment by small vibratory mechanical compactors. Continue rolling or compacting until acceptable consolidation is achieved. KEH will determine type and number of passes required for particular compacting equipment used based on trial placement in subparagraph 3.3.1.1 for each asphalt type and specific percent of liquid asphalt.

- a. It is anticipated that desired compaction can be obtained with 6 passes of tandem wheel steel roller weighing at least 8 to 10 tons for the AR 4000 mix.

b. The acceptable level of compaction shall be a minimum of 65 percent of maximum density as determined by WSDOT Test Method 705 for both mixes.

c. Allow a minimum of 12 hours interim or a maximum material temperature of 140 F before placement of subsequent lifts of the AR4000 mix.

d. Dual drive tandem wheel steel rollers are recommended.

3.3.2 Geotextile

3.3.2.1 Lay to minimize tension, stress, folds, wrinkles, or creases, and to provide minimum 18 inch overlap for each joint.

3.3.2.2 Use bags of clean, washed gravel to secure material during installation. Do not use securing pins.

3.4 CONTAMINATED MATERIAL

3.4.1 Remove placed or stored material that has excess dirt or dust contamination, as determined by KEH.

3.5 FIELD QUALITY CONTROL

3.5.1 Verify placement and compaction of diffusion barrier and geotextile as specified in subparagraphs 3.3.1.1 and 3.3.1.9.

3.5.2 Sampling and testing of aggregate and coated gravel will be performed by KEH. Rolling and compaction requirements will be controlled based on subparagraph 3.3.1.9.

3.5.3 KEH will examine equipment referenced in subparagraph 3.3.1.5 for cleanliness.

SOIL COMPACTION PROCEDURE

Project No.		Project Title		Date				
Contract No.		Procedure No.	Location of Demonstration					
REQUIREMENTS			EQUIPMENT DEMONSTRATED					
A	Applicable Spec./Dwg.		Type					
	Compaction Required %		Manufacturer					
	Maximum Lift Size		Model					
LABORATORY SOIL TEST RESULTS								
B	<input type="checkbox"/> Non-granular Materials (WSDOT Test Method No. 609)		<input type="checkbox"/> Granular Materials (WSDOT Test Method No. 606-A)					
	COMPACTATION DEMONSTRATION TEST RESULTS							
Formula for Percent Compaction: $\frac{\text{dry density}}{\text{max density}} \times 100 = \text{Percent Compaction}$								
C	No. of Passes	Depth of Lift	Percent Moisture	Lbs/ft ³ Dry	Maximum Density	Percent Compaction	Accept	Reject
Observations or Comments								
TEST METHOD USED FOR DEMONSTRATION		<input type="checkbox"/> Nuclear Gage (ASTM D2922 & D3017)		<input type="checkbox"/> Sand Cone (ASTM D1556)		<input type="checkbox"/> Other _____		
						Apparatus No. _____		
D	Contractor Representative					Date		
	Government Representative	02145 - 8				Date B-714-C2		

INSTRUCTIONS

- This Soil Compaction Procedure form, when approved by the Government Representative, constitutes an approved compaction procedure.

Section A is the responsibility of the Construction Contractor. It is to be completed at the time of backfill compaction demonstration and presented to the Government Representative.

Section B is completed by the Government Representative. Data entered is obtained from the agency that performs the laboratory testing.

Section C is completed by the Government Representative as the demonstration is performed. Using the applicable formula, the percent compaction achieved is determined and entered. Acceptance is based on the results as compared with the compaction percent required in Section A.

Section D is signed and dated by the Construction Contractor Representative acknowledging responsibility for this procedure and compliance thereto for applicable backfill operations. Section D is signed and dated by the Government Representative to signify approval.

END OF SECTION

KEH-5162 (B-714)
Phase Activities vs. CPM Activities
June 5, 1989

PHASE I ACTIVITIES

a. Payment and Performance Bonds

b. Mobilization

c. Submittals

d. Produce gravel diffusion material for installation under Catch Basin for Vaults 102, 103, 104 and 105.

e. Furnish HDPE liners, geotextiles and drainage nets for Vaults 102 and 103.

f. Furnish leachate collection sump liner and riser for Vaults 102 and 103.

g. Foundation excavation for Vaults 102, 103, 104 and 105.

h. Place diffusion barrier and asphalt overlay under catch basin for Vaults 102, 103, 104 and 105.

i. Form, install reinforcing steel, and place concrete for leachate sump foundation for Vaults 102 and 103.

CPM ACTIVITIES

022 - Mobilize KEH-5162

025 - Produce diff. Brk under CB 102/103
0255 - Produce diff. Brk under CB 104/105

054 - Factory prepare Liners 102/103

NA9 - Fab/Del Leachate Sump/Riser 102/103

0265 - Excavate to Grade 104/105

NA5 - Excavate to Grade 102/103

027 - Asphalt Protection 102 & 103

0275 - Asphalt Protection 104 & 105

028 - Diff. Break under CB slabs 102/103

0285 - Diff. Break under CB slabs 104/105

101 - FR & P Leachate Coll. Pit Fnd #102

102 - FR & P Leachate Coll. Pit Fnd #103

103 - Strip & Cure Leachate Coll. Pit Fnd 102

104 - Strip & Cure Leachate Coll. Pit Fnd 103

- j. Place leachate sump and 4 inch catch basin drainage pipe and encase in concrete for Vaults 102 and 103.

k. Form, install reinforcing steel and place concrete for catch basin for Vault 102.

l. Form, install reinforcing steel and place concrete for catch basin for Vault 103.

m. Install liner, geotextile, 4 inch perforated pipe, and gravel for Vaults 102 and 103.

n. Form, install reinforcing steel, and place concrete for floor of Vault 102.

PHASE II ACTIVITIES

a. Furnish HDPE liners, geotextiles and drainage nets for Vaults 104 and 105.

b. Furnish leachate collection sump Tiner and riser for Vaults 104 and 105.

c. Form, install reinforcing steel, and place concrete for leachate sump foundation for Vaults 104 and 105.

034 - Encase Leachate Coll. Liner #102
036 - Encase Leachate Coll. Liner #103

038 - FR & P #102 CB Slab & CRB
040 - Cure #102 CB Slab
042 - Strip Forms #102 CB Slab/Curb

044 - FR & P #103 Slab & Crb
046 - Cure #103 CB Slab
048 - Strip forms #103 CB Slab/curb

056 - Install liner CB #102
058 - Install Geot Cover over liner #102
060 - Gravel fill over geot liner #102
062 - Install liner CB #103
064 - Install Geot Cover over liner #103
066 - Gravel fill over geot liner #102

074 - FR & P Slab for Vault #102
078 - Cure slab Vault #102

055 - Factory prepare liners 104/105

NA95 - Fab/del Leach. Sump/Riser 104/105

1015 - FR & P Leachate Coll. Pit Fnd #104
1025 - FR & P Leachate Coll. Pit Fnd #105
1035 - Strip & Cure Leachate Coll Pit Fnd
104
1045 - Strip & Cure Leachate Coll Pit Fnd
105

- d. Place leachate sump and 4 inch catch basin drainage pipe and encase in concrete for Vaults 104 and 105. 0345 - Encase Leachate Coll. Liner #104
0365 - Encase Leachate Coll. Liner #105
 - e. Form, install reinforcing steel and place concrete for catch basin for Vault 104. 0385 - FR & P #104 CB Slab & Crb
0405 - Cure #104 CB slab
0425 - Strip Forms #104 CB Slab/Crb
 - f. Form, install reinforcing steel, and place concrete for catch basin for Vault 105. 0445 - FR & P #105 CB slab & Crb
0465 - Cure 3105 CB Slab
0485 - Strip Forms #104 CB Slab/Curb
 - g. Install liner, geotextile, 4 inch perforated pipe, and gravel for Vaults 104 and 105. 0565 - Install liner CB #104
0585 - Install geot cover over liner #104
0605 - Gravel fill over geot liner #104
0625 - Install liner CB #105
0645 - Install geot cover over liner #105
0665 - Gravel fill over geot liner #104
 - h. Form, install reinforcing steel, and place concrete for floor of Vault 103. 076 - FR & P slab for Vault #103
080 - Cure slab Vault #103
 - i. Form, install reinforcing steel, and place concrete for floor of Vault 104. 0745 - FR & P slab for Vault #104
0785 - Cure slab Vault #104
 - j. Form, install reinforcing steel, and place concrete for floor of Vault 105. 0765 - FR & P slab for Vault #105
0805 - Cure slab Vault #105
 - k. Form, install reinforcing steel, and place concrete for walls of Vault 102. 088 - FR & P Walls Vault #102
091 - Cure Walls Vault #102
 - l. Form, install reinforcing steel and place concrete for walls of Vault 103. 090 - FR & P Walls Vault #103
092 - Cure Walls Vault #103

PHASE III ACTIVITIES

- a. Form, install reinforcing steel, and place concrete for walls of Vault 104. 0885 - FR & P Walls Vault #104
0915 - Cure Walls Vault #104
- b. Form, install reinforcing steel, and place concrete for walls of Vault 105. 0905 - FR & D Walls Vault #105
0925 - Cure Walls Vault #105
- c. Apply asphalt coating to interior of Vaults 102, 103, 104 and 105. 093 - Coat/Cure Vault #102 Walls-Asphalt
0935 - Coat/Cure Vault #104 Walls-Asphalt
094 - Fill, Hydro & empty Vault #102
0945 - Fill, Hydro & empty Vault #104
095 - Coat/Cure Vault #103 Walls-Asphalt
0955 - Coat/Cure Vault #105 Walls-Asphalt
096 - Fill, Hydro & Empty Vault #103
0965 - Fill, Hydro & Empty Vault #105
- d. Install exterior drainage path for Vaults 102, 103, 104 and 105. A02 - Drainage Net #102
A025 - Drainage Net #104
A22 - Drainage Net #103
A225 - Drainage Net #105
- e. Produce gravel diffusion material necessary to complete backfill to elevation 650.5 for Vaults 102, 103, 104 and 105. 023 - Prod. Diff Brk Bkf1 102/103
0235 - Prod. Diff Brk Bkf1 104/105
- f. Place diffusion barrier and backfill around vault 102 and 1 side of Vault 103 to top of walls. 106 - Leachate 26" Riser Pipe #102
112 - Bkf1 to top of walls Vault #102
- g. Place diffusion barrier and backfill around Vault 103 and 1 side of Vault 104 to top of walls. 108 - Leachate 26" Riser Pipe #103
113 - Bkf1 to top of walls Vault #103
- h. Furnish precast prestressed concrete cover blocks for Vaults 102 and 103. NA7 - Fab/Del Roof Panels 102
NA71 - Fab/Del Roof Panels 103

- i. Set precast, prestressed concrete cover blocks for Vaults 102 and 103. 156 - Set roof panels #102
160 - Set roof panels #103
 - j. Form, install reinforcing steel and place concrete for 4 excess water pits, vault pit and leachate pit for Vault 102 and 103. 170 - FR & P Excess Wtr Pits #102
172 - FR & P Excess Wtr Pits #103
174 - FR & P Valve Pit #102
176 - FR & P Valve Pit #103
178 - FR & P Leachate Pit #102
180 - FR & P Leachate Pit #103
 - k. Place concrete topping over cover block of Vaults 102 and 103. 164 - Seal roof panels #102
166 - Seal roof panels #103
200 - FR & P Cap over Roof Panels #102
202 - FR & P Cap over Roof Panels #103
204 - Cure Cap over Vault Roof Panels 102
206 - Cure Cap over Vault Roof Panels 103
 - l. Perform air leakage test on Vaults 102 and 103.
 - m. Install roof penetration risers for Vaults 102 and 103. A01 - Penetrations in roof panels #102
A11 - Penetrations in roof panels #103
 - n. Produce gravel diffusion material for completion of all backfill on Vaults 102, 103, 104 and 105. 024 - Prod. Diff Brk Above 102/103
0245 - Prod. Diff Brk Above 104/105
 - o. Place 3 feet of diffusion barrier and temporary protective geotextile over roofs of Vaults 102 and 103. 210 - Bkfl 3' over roof cap Vault #102
211 - Bkfl 3' over roof cap Vault #103
907 - Dust cover over gravel barrier #102
908 - Dust cover over gravel barrier #103
 - p. Furnish prefabricated pipe spools for piping to and over Vaults 102 and 103. 215 - Prefab pipelines 102/103
 - q. Furnish prefabricated pipe spools for piping to and over Vaults 104 and 105. 2155 - Prefab pipe lines 104/105

- r. Install encased grout feed and excess water pipe liens from tie-in point to Vault pit for Vaults 102 and 103 including piping extension to future vaults
 - 260 - Berm 3' Bkfl over new pipelines #102
 - 261 - Berm 3' Bkfl over new pipelines #103
 - P112 - Excavate for pipes to 102/103
 - P113 - Install pipes to 102/103
 - P115 - Urethane Foam pipe bmds #102
 - P116 - Urethane Foam pipe bmds #103

- s. Install encased excess water pipe over vault from Vault pit to 4 excess water pits and leachate collection pit to excess water pit for Vaults 102 and 103.
 - 220 - Run pipe lines to Valve Pit #102
 - 224 - Run pipe lines to Valve Pit #103
 - 262 - Excavate for pipes over #102
 - 263 - Excavate for pipes over #103

- t. Furnish electrical and instrumentation materials required to complete Vaults 102 and 103. Include electrical distribution transformer at Vault 102 and cathodic protection materials for TGE and Vaults 101, 102, and 103.
 - NA11 - Deliver elec matl 102/103

- u. Complete installation of cathodic protection for pipe at TGE and Vault 101.
 - 226 - Cathodic Protection at TGE
 - 2265 - Cathodic Protection for pipe to #101

- v. Install cathodic protection for pipe to Vault 102/103 including piping extension for future vaults.
 - 222 - Cathodic Protection for pipe to #102

- w. Install power pole, transformers, and electrical service to Manhole 104.
 - 402 - Misc Elec. not in excav. area 102/103

- x. Install electrical service and equipment to Manhole 102A and Vault 102. Include 225 KVA distribution transformer.
 - 404 - Install Electrical #102

- y. Install electrical service and equipment to Manhole 103A and Vault 103. 405 - Install Electrical #103/104
- z. Furnish electrical and instrumentation materials required to complete Vaults 104 and 105. Include cathodic protection materials for Vault 104/105. NA115 - Deliver Elec. Matl 104/105
- aa. Install instrumentation for Vaults 102 and 103. 230 - Instl Instrumentation 102
231 - Instl Instrumentation 103
- bb. Apply special protective coatings and identification markings to Vault 102 and 103. P117 - Paint & ID Markings #102
P118 - Paint & ID Markings #103
- cc. Fabricate and install cast-in-place cover blocks for excess water pits, leachate collection pit and vault pit for Vaults 102, 103, 104 and 105. P108 - Fab pit cover blocks #102
P1085 - Fab pit cover blocks #104
P109 - Fab pit cover blocks #103
P1095 - Fab pit cover blocks #105
- dd. Fabricate and install drain seal assemblies, T-handle plugs and guard rails for Vaults 102 and 103. P119 - Drain seal assembly #102
P120 - Drain seal assembly #103
- ee. Furnish precast prestressed concrete cover block for Vaults 104 and 105. NA75 - Fab/Del Roof Panels 104/105

PHASE IV ACTIVITIES

- a. Place diffusion barrier and backfill around Vaults 104 and 105 to top of walls. 1065 - Leachate 26" Riser pipe #104
1085 - Leachate 26" Riser pipe #105
1125 - Bkfl to top of walls Vault #104
1135 - Bkfl to top of walls Vault #105
- b. Set precast, prestressed concrete cover blocks for Vaults 104 and 105. 1565 - Set roof panels #104
1605 - Set roof panels #105

- c. Form, install reinforcing steel and place concrete for 4 excess water pits, vault pit and leachate pit for Vaults 104 and 105.
 - 1705 - FR & P 4 excess wtr pits #104
 - 1725 - FR & P 4 excess wtr pits #105
 - 1745 - FR & P Valve Pit #104
 - 1765 - FR & P Valve Pit #105
 - 1785 - FR & P Leachate Pit #104
 - 1805 - FR & P Leachate Pit #105

- d. Place concrete topping over cover block of Vaults 104 and 105.
 - 1645 - Seal roof panels #104
 - 1665 - Seal roof panels #105
 - 2005 - FR & P Cap over Roof Panels #104
 - 2025 - FR & P Cap over Roof Panels #105
 - 2045 - Cure Cap over Vault Roof Panels #104
 - 2065 - Cure Cap over Vault Roof Panels #105

- e. Perform air leakage test on Vaults 104 and 105.

- f. Install roof penetration risers for Vaults 104 and 105.
 - A015 - Penetrations in Roof Panels #104
 - A115 - Penetrations in Roof Panels #105

- g. Place 3 feet of diffusion barrier and temporary protective geotextile over roofs of Vaults 104 and 105.
 - 2105 - Bkfl 3' over Roof Cap Vault #104
 - 2115 - Bkfl 3' over Roof Cap Vault #105
 - 9075 - Dust cover over gravel barrier #104
 - 9085 - Dust cover over gravel barrier #105

- h. Install encased grout feed and excess water pipe lines form tie-in point to Vault pit for Vaults 104 and 105 including piping extension to future vaults.
 - 2605 - Berm 3' Bkfl over new pipelines #104
 - 2615 - Berm 3' Bkfl over new pipelines #105
 - P1125 - Excavate for pipes to 104/105
 - P1135 - Install pipes to 104/105
 - P1155 - Urethane Foam pipe bends #104
 - P1165 - Urethane Foam pipe bends #105

- i. Install encased excess water pipe over vault from vault pit to excess water pits and leachate collection pit to excess water pit for Vaults 104 and 105. 2205 - Run Pipe Lines to Valve Pit #104
2245 - Run Pipe Lines to Valve Pit #105
2625 - Excavate for Pipes over #104
2635 - Excavate for Pipes over #105
- j. Install cathodic protection for pipe to Vault 104/105 including piping extension for future vaults. 2225 - Cathodic Protection for Pipe to #104
- k. Install electrical service and equipment from Manhole 105A to Vault 105 and Manhole 103A to vault 104. 4055 - Install Electrical #105
- l. Install instrumentation for Vaults 104 and 105. 2315 - Install Instrumentation #105
2305 - Install Instrumentation #104
- m. Apply special protective coatings and identification markings to Vaults 104 and 105. P1175 - Paint & ID Markings #104
P1185 - Paint & ID Markings #105
- n. Fabricate and install drain seal assemblies, T-handle plugs and guard rails for Vaults 104 and 105. P1195 - Drain Seal Assembly #104
P1205 - Drain Seal Assembly #105
- o. Deliver project record documents for Vaults 102, 103, 104 and 105. 991 - Deliver 3A Documents 102
992 - Deliver 3A Documents 103
995 - Deliver 3A Documents 104/105
- p. Demobilize P110 - Complete KEH-5162 & Demobilize

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352

REQUEST FOR PROPOSAL NO.: KEH-5162 (B-714)
DATE OF ISSUE: May 5, 1989
DATE BIDS DUE (STEP TWO): July 7, 1989

June 26, 1989

ADDENDUM NO. 4

**VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE
DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE,
RICHLAND, WASHINGTON**

Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989 for subject work is hereby modified as follows:

1. Construction Specification No. B-714-C2, Revision 0 and Construction/Reference drawings identified in Schedule of Drawings are modified as noted in the attached Engineering Change Notice B-714-10 dated June 23, 1989.

Receipt of this addendum shall be acknowledged on the Bid Form in the space provided therefor. Failure to acknowledge receipt of all addenda may be cause for rejection of your bid.

KAISER ENGINEERS HANFORD COMPANY



FOR M. A. Colby
Contract Administrator

MAC:mj

Attachment
ECN B-714-10

ENGINEERING CHANGE NOTICE																																																
		Page 1 of 25																																														
2. ECN Category (mark one)		1. ECN <u>110153</u>																																														
<input checked="" type="checkbox"/> Supplemental <input type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void		3. Originator's Name, Organization, MSIN, and Telephone No. TERESA EHRHARD, KEH, 6-2381																																														
		4. Date 6-23-89																																														
		5. Project Title/No./Work Order No. B-714 GROUT VAULT PAIR (218-E-16-102&103)/ER8007																																														
		6. Bldg./Sys./Fac. No. 218-E-16-102&103																																														
		7. Impact Level 3																																														
		8. Document Number Affected (include rev. and sheet no.) SEE BLOCK 12																																														
		9. Related ECN No(s). NONE																																														
		10. Related PO No. N/A																																														
11a. Modification Work		11b. Work Package Doc. No.																																														
<input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <u>UNKNOWN</u>		11c. Complete Installation Work N/A Cog. Engineer Signature & Date																																														
		11d. Complete Restoration (Temp. ECN only)																																														
		N/A Cog. Engineer Signature & Date																																														
12. Description of Change CHANGES TO DRAWINGS AND SPECIFICATION SEE:																																																
CIVIL - PAGES 3 Thru 20 ENVIR - PAGE 21 PIPING - PAGE 22 INSTM - PAGE 23 ELEC - PAGES 24 & 25																																																
<i>REV 6/27/89</i>																																																
AFFECTED DRAWINGS AS FOLLOWS & CONSTRUCTION SPECIFICATION B-714-C2: (<u>V-B714C2-003</u>)																																																
<table border="0"> <tbody> <tr><td>H-2-77573, Sh 1, Rev 0</td><td>H-2-77590, Sh 1, Rev 0</td><td>H-2-77597, Sh 1, Rev. 0</td></tr> <tr><td>H-2-77575, Sh 1, Rev 1</td><td>H-2-77593, Sh 3, Rev 0</td><td>H-2-77605, Sh 1, Rev. 0</td></tr> <tr><td>H-2-77576, Sh 1, Rev 0</td><td>H-2-77619, Sh 1, Rev 0</td><td>H-2-77608, Sh 1, Rev. 0</td></tr> <tr><td>H-2-77578, Sh 1, Rev 0</td><td>H-2-77635, Sh 1, Rev 0</td><td>H-2-77609, Sh 1, Rev. 0</td></tr> <tr><td>H-2-77580, Sh 4, Rev 0</td><td>H-2-77636, Sh 2, Rev 0</td><td></td></tr> <tr><td>H-2-77581, Sh 1, Rev 0</td><td>H-2-77636, Sh 4, Rev 0</td><td></td></tr> <tr><td>H-2-77584, Sh 1, Rev 0</td><td>H-2-77637, Sh 1, Rev 0</td><td></td></tr> <tr><td>H-2-77585, Sh 1, Rev 0</td><td>H-2-77638, Sh 1, Rev 0</td><td></td></tr> <tr><td>H-2-77586, Sh 1, Rev 0</td><td>H-2-77638, Sh 3, Rev 0</td><td></td></tr> <tr><td>H-2-77587, Sh 1, Rev 0</td><td>H-2-77639, Sh 1, Rev 0</td><td></td></tr> <tr><td>H-2-77587, Sh 2, Rev 0</td><td>H-2-77639, Sh 2, Rev 0</td><td><i>EL2764/89</i></td></tr> <tr><td>H-2-77588, Sh 2, Rev 0</td><td>H-2-77641, Sh 1, Rev 0</td><td></td></tr> <tr><td>H-2-77588, Sh 4, Rev 0</td><td>H-2-77583, Sh 1, Rev 0</td><td></td></tr> <tr><td>H-2-77588, Sh 5, Rev 0</td><td>H-2-77580, Sh 2, Rev 0</td><td></td></tr> <tr><td></td><td>H-2-77581, Sh 2, Rev 0</td><td></td></tr> </tbody> </table>				H-2-77573, Sh 1, Rev 0	H-2-77590, Sh 1, Rev 0	H-2-77597, Sh 1, Rev. 0	H-2-77575, Sh 1, Rev 1	H-2-77593, Sh 3, Rev 0	H-2-77605, Sh 1, Rev. 0	H-2-77576, Sh 1, Rev 0	H-2-77619, Sh 1, Rev 0	H-2-77608, Sh 1, Rev. 0	H-2-77578, Sh 1, Rev 0	H-2-77635, Sh 1, Rev 0	H-2-77609, Sh 1, Rev. 0	H-2-77580, Sh 4, Rev 0	H-2-77636, Sh 2, Rev 0		H-2-77581, Sh 1, Rev 0	H-2-77636, Sh 4, Rev 0		H-2-77584, Sh 1, Rev 0	H-2-77637, Sh 1, Rev 0		H-2-77585, Sh 1, Rev 0	H-2-77638, Sh 1, Rev 0		H-2-77586, Sh 1, Rev 0	H-2-77638, Sh 3, Rev 0		H-2-77587, Sh 1, Rev 0	H-2-77639, Sh 1, Rev 0		H-2-77587, Sh 2, Rev 0	H-2-77639, Sh 2, Rev 0	<i>EL2764/89</i>	H-2-77588, Sh 2, Rev 0	H-2-77641, Sh 1, Rev 0		H-2-77588, Sh 4, Rev 0	H-2-77583, Sh 1, Rev 0		H-2-77588, Sh 5, Rev 0	H-2-77580, Sh 2, Rev 0			H-2-77581, Sh 2, Rev 0	
H-2-77573, Sh 1, Rev 0	H-2-77590, Sh 1, Rev 0	H-2-77597, Sh 1, Rev. 0																																														
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H-2-77587, Sh 1, Rev 0	H-2-77639, Sh 1, Rev 0																																															
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H-2-77588, Sh 5, Rev 0	H-2-77580, Sh 2, Rev 0																																															
	H-2-77581, Sh 2, Rev 0																																															
13a. Justification (mark one)		13b. Justification Details																																														
<input type="checkbox"/> Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input checked="" type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input checked="" type="checkbox"/> Design Error/Omission		1) CHANGES TO INCORPORATE BID PACKAGE COMMENTS & WHC COMMENTS 2) INTERDISCIPLINE COORDINATION																																														
14. Distribution (include name, MSIN, and no. of copies)																																																
KEH DISTRIBUTION WHC DISTRIBUTION RELEASE STAMP																																																
Engng Doc Cntl Const Doc Cntl		TCPC/5-8-D 2910E/200E	S. R. Briggs R3-43 J. L. Gilbert R3-46 O. A. Halverson R3-09 J. R. McGee S1-54 D. E. Palmer R3-43 A. E. Young S0-05 Project Files R1-28 DOE A. G. Lassila A5-18																																													

ENGINEERING CHANGE NOTICE

Page 2 of 25

1. ECN (use no. from pg. 1)
B-714-10

15. Design Verification Required

 Yes
 No

16. Cost Impact

ENGINEERING

Additional \$ 500⁰⁰
 Savings \$ _____

CONSTRUCTION

Additional \$ 1,000⁰⁰
 Savings \$ _____

17. Schedule Impact (days)

Improvement _____
Delay _____

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD

Functional Design Criteria

Operating Specification

Criticality Specification

Conceptual Design Report

Equipment Spec.

Const. Spec.

Procurement Spec.

Vendor Information

OM Manual

FSAR/SAR

Safety Equipment List

Radiation Work Permit

Environmental Impact Statement

Environmental Report APPENDIX A

Environmental Permit APPENDIX Y

(QAA Plan & VAULT Report) DRB

Seismic/Stress Analysis

Stress/Design Report

Interface Control Drawing

Calibration Procedure

Installation Procedure

Maintenance Procedure

Engineering Procedure

Operating Instruction

Operating Procedure

Operational Safety Requirement

IEFD Drawing

Cell Arrangement Drawing

Essential Material Specification

Fac. Proc. Samp. Schedule

Inspection Plan

Inventory Adjustment Request

Tank Calibration Manual

Health Physics Procedure

Spares Multiple Unit Listing

Test Procedures/Specification

Component Index

ASME Coded Item

Human Factor Consideration

Computer Software

Electric Circuit Schedule

ICRS Procedure

Process Control Manual/Plan

Process Flow Chart

Purchase Requisition

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision

Document Number/Revision

Document Number/Revision

20. Approvals

Signature

Date

Signature

Date

OPERATIONS AND ENGINEERING

Cog./Project Engineer

DR Bui

6/26/89

6/26/89

Cog./Project Engr. Mgr.

J.T. Gifford

6/26/89

6/26/89

QA

Jacqueline

6/27/89

6-26-89

Safety

NA

27 JRM/jsc

6/26/89

Security

Proj. Prog./Dept. Mgr.

Def. React. Div.

Chem. Proc. Div.

Def. Wst. Mgmt. Div.

Adv. React. Dev. Div.

Proj. Dept.

Environ. Div.

IRM Dept.

Facility Rep. (Ops)

Other

ARCHITECT-ENGINEER

PE

QA

Safety

Design

Other

Signature

Date

H. Johnson

6/26/89

D. Lippman

6-26-89

C. Raffaele

6/26/89

E.I. K. Cook, H. Steffens

6/26/89

P. O'Leary

6/26/89

E.W. Shiroki, P. Ray

6-26-89

S. Specs

6-26-89

W.H. Greenberg

6-26-89

DEPARTMENT OF ENERGY

ADDITIONAL

Ref. Dwg. See Below	Sh. —	Rev. —	Prepared By T. Ehrhard	Checked By G. Koci	ECN No. B-714-10	Page 3
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CIVIL/STRUCTURAL1. H-2-77573, Sh 1, Rev 0, Drawing List (Z D4-D6)

- a. Change H-2-77603 to read H-2-77603, Sh 1.
- b. Add: H-2-77603, Sh 2 8405 Jumper assembly leachate recycle specifications.

2. H-2-77575, Sh 1, Rev 1, General Notes (Z B2)

Add: 5 - For diffusion barrier placement see Specification B-714-C2, Section 02145 and Dwg. H-2-77578.

3. H-2-77576, Sh 1, Rev 0, General Note 2 (Z B2)

Change protect geotextile with . . . to read protect "temporary protective" geotextile with . . .

4. H-2-77578, Sh 1, Rev 0

- a. General Note 3 (Z B2): Change protect geotextile with . . . to read protect "temporary protective" geotextile with . . .
- b. Section B (Z C2-D5): Modify section as shown on Page 6 of this ECN.

5. H-2-77580, Sh 2, Rev 0, General Note 9 (Z C1)

Change 90° to 90°C.

6. H-2-77580, Sh 4, Rev 0

- a. Detail 2 (Z D3): Change 2" CL to read 2" CLR.
- b. Detail 3 (Z D1): Change 2" CL to read 2" CLR.
- c. Section C (Z D7): Change Detail 2 callout to 3.
- d. Section C (Z B7): Modify section as shown on Page 7 of this ECN.

7. H-2-77581, Sh 1, Rev 0, Precast Roof Plan (Z C1, C8, E1 and E8)

Modify penetration size as shown on Page 8 of this ECN.

8. H-2-77581, Sh 2, Rev 0, General Note 1 (Z B1)

Change referenced Section 03301 to 03419.

9. H-2-77584, Sh 1, Rev 0, Plan of Cover Blocks (Z C3-D2)

Modify plan as shown on Page 9 of this ECN.

Ref. Dwg. See Below	Sh.	Rev.	Prepared By T. Ehrhard	Checked By G. Koci	ECN No. B-714-10	Page 4
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10. H-2-77585, Sh 1, Rev 0, Skid Plate Detail 7 (Z B3-C4)

Modify detail as shown on Page 10 of this ECN.

11. H-2-77586, Sh 1, Rev 0

- a. Plan of Cover Blocks (Z D1-E2): Modify as shown on Page 11 of this ECN.
- b. Skid Plate Detail 7 (Z B5-C6): Modify as shown on Page 12 of this ECN.
- c. Plan (Z D7): Add reinforcing as shown on Page 13 of this ECN.

12. H-2-77587, Sh 1, Rev 0

- a. Penetration Plan (Z C8): Change H-2-98443 to read H-2-77602.
- b. Penetration Plan (Z C3, C8, E3, E8): Change pipe diameter pictorially to 24" on Rise 1,2,3, and 4.
- c. Penetration Plan (Z E8 and E4): Move Riser 53 right one cover block and move Riser 54 left one cover block.
- d. Table:

1. Change riser size for 1,2,3 and 4 from 12" to 24" (Z F2), (Z B1 and F1).
2. Change north/west coordinates of risers as follows:

Riser # 1 & 2 to read N40516.42
Riser # 3 & 4 to read N40469.08
Riser # 6 & 8 to read W45486.15
Riser # 51 to read W45471.25
Riser # 52 to read W45468.50
Riser # 53 to read W45595.25
Riser # 54 to read W45499.25

13. H-2-77587, Sh 2, Rev 0

- a. Penetration Plan (Z C8): Change H-2-98443 to read H-2-77602.
- b. Penetration Plan (Z C3, C8, E3 and E8): Change pipe diameter pictorially to 24" on Riser 1,2,3 and 4.
- c. Penetration Plan (Z E8 and E4): Move Riser 53 right one cover block and move Riser 54 left one cover block.
- d. Table:

1. Change riser size for 1,2,3 and 4 from 12" to 24" (Z F2).
2. Change north/west coordinates of risers as follows (Z B1 and F1):

Riser # 1 & 2 to read N40429.92
Riser # 3 & 4 to read N40382.58
Riser 6,8,51,52,53 & 54 make same riser coordinate changes as shown in 12 d.2 above.

Ref. Dwg. See Below	Sh. -	Rev. -	Prepared By T. Ehrhard	Checked By G. Koci	ECN No. B-714-10	Page 5
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14. H-2-77588, Sh 2, Rev 0

- a. Change pit table and electrical table as shown on Page 14 of this ECN (Z C1-4 and E3).

- b. Riser Table:

1. change riser size for 1,2,3 and 4 from 12" to 24" (Z F8).
2. Make same riser coordinate changes as shown in 12 d.2 above.

15. H-2-77588, Sh 4, Rev 0

- a. Change plan as shown on Page 15 of this ECN (Z D5 and F7).
- b. Change pipe diameter size pictorially from 12" to 24" (Z C3, C8, E3, and E8).

16. H-2-77588, Sh 5, Rev 0

- a. Change pits, piping and electrical table as shown on Page 16 of this ECN (Z C1-4, D4, and E3).
- b. Riser Table:

1. Change riser size for 1,2,3 and 4 from 12" to 24" (Z F8).
2. Make same riser coordinate changes as shown in 13 d.2 above.

17. H-2-77590, Sh 1, Rev 0

- a. Plan of cover blocks (Z E1-F2): Change plan as shown on Page 17 of this ECN.
- b. Skid Plate Detail 7 (Z B5-C65): Change detail as shown on Page 18 of this ECN.

18. H-2-77593, Sh 3, Rev 0

- a. Section B (Z E7-F8): Change section as shown on Page 19 of this ECN.
- b. Section C (Z C7-D8): Change section as shown on Page 20 of this ECN.

Construction Specification B-714-C2

1. Section 03419: Under 1.2.6 replace "Section 01400" with "Section 01400 Article 1.3."

/cah

Ref. Dwg.

Sh

Rev.

Prepared By

TK EHRHARD

Checked By

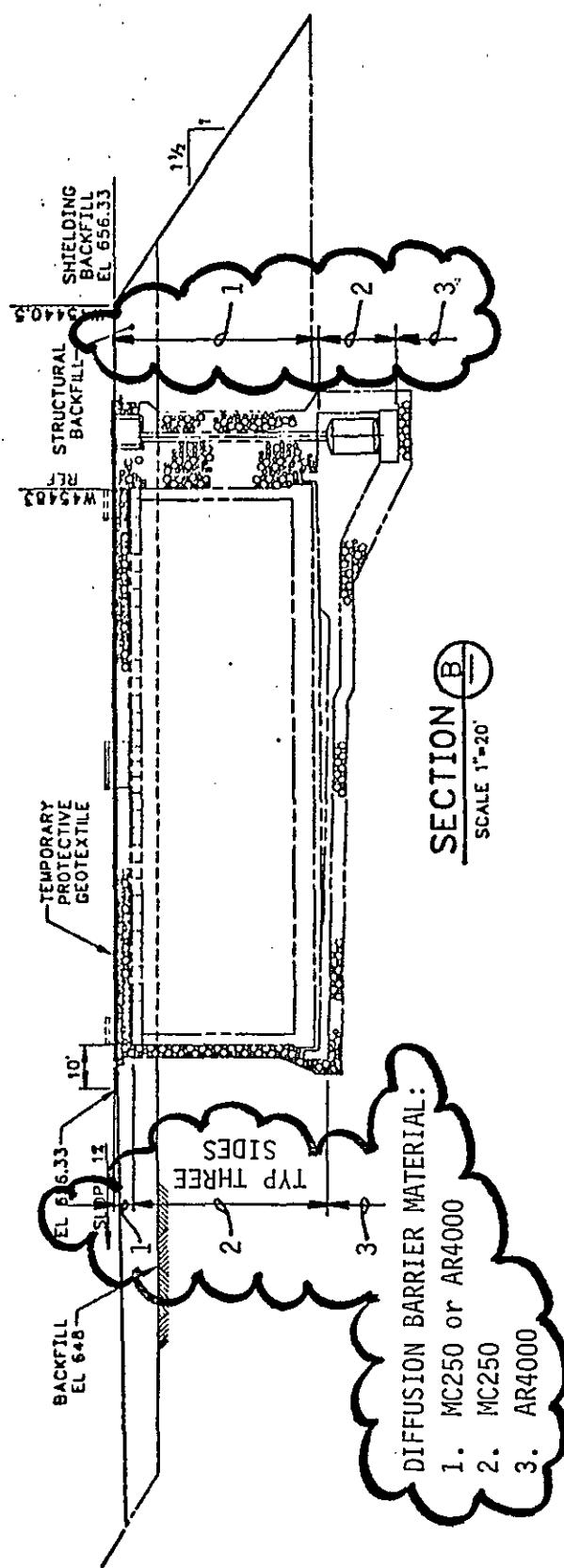
Dr. Kocí

ECN No.

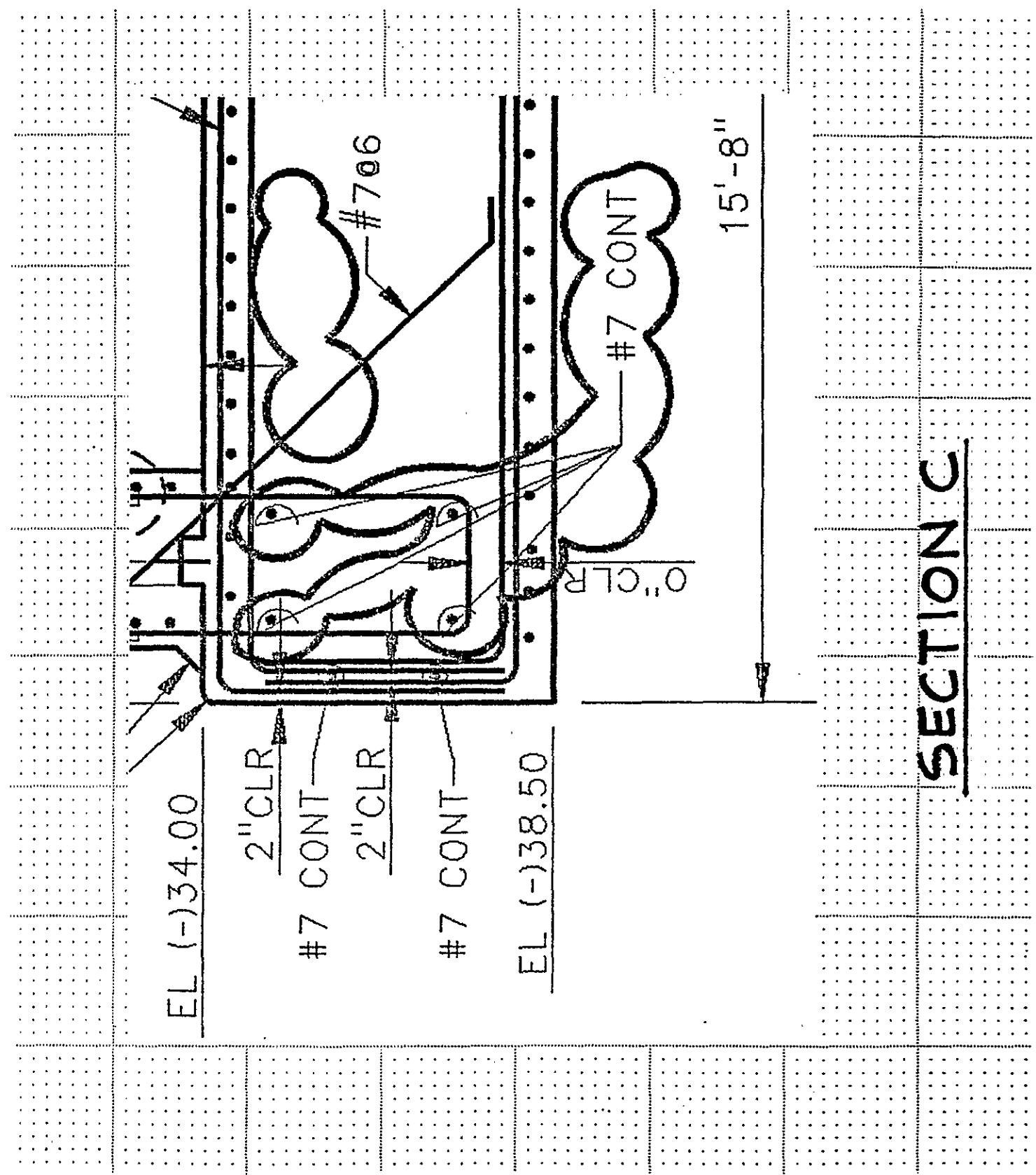
B-714-10

Page

6



Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-77580	4	O	TK EHRHARD	G. Koci	B-714-10	7



Ref. Dwg.

H-2-77581

Sh.

I

Rev.

O

Prepared By

TKEHRHARD

Checked By

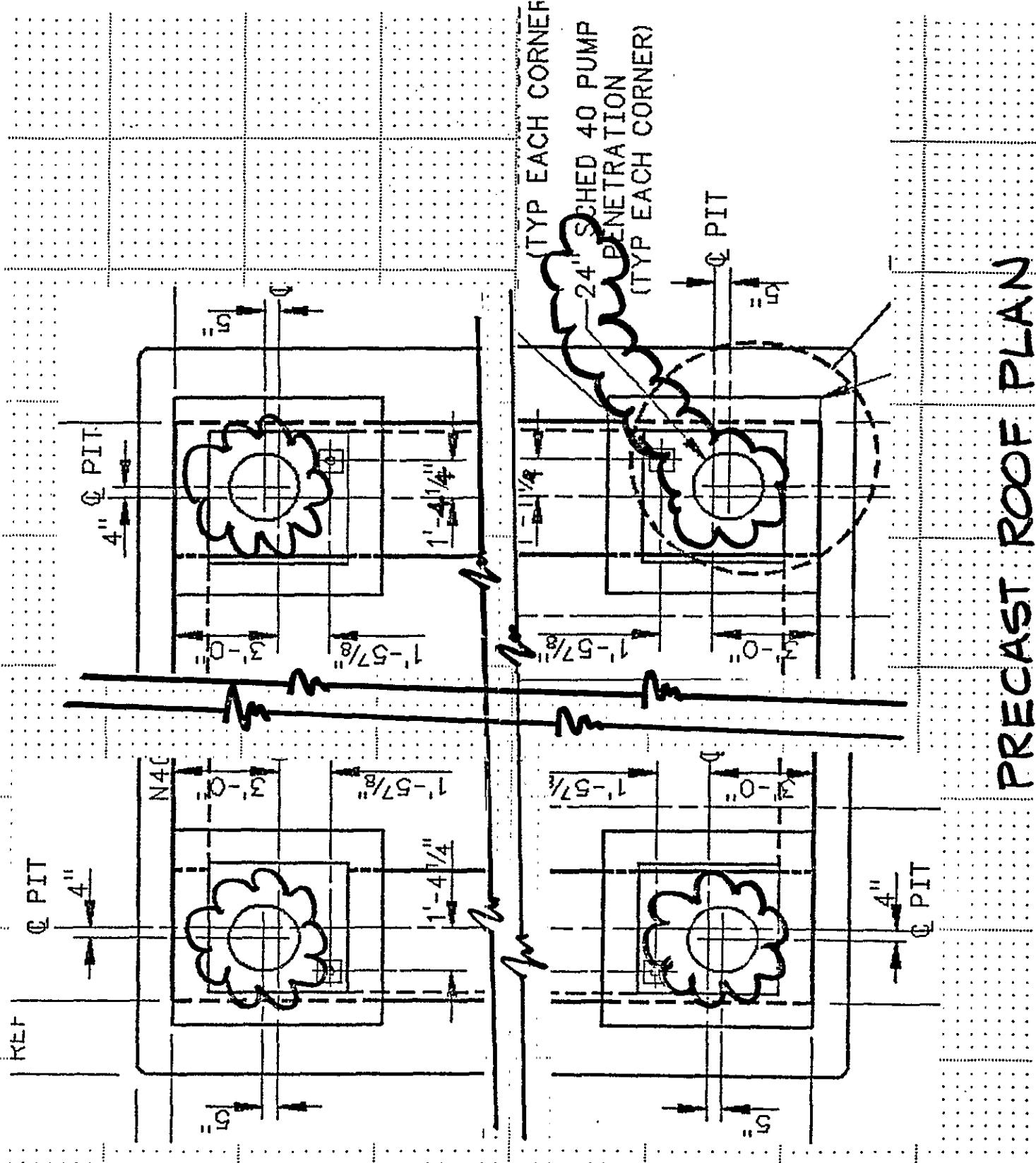
G.Koci

ECN No.

B-714-10

Page

8



9 1 1 1 3 9 1 3 1 9 7

**KAISER ENGINEERS
HANFORD**
ENGINEERING CHANGE NOTICE SKETCH

Ref. Dwg.

H-2-77584

Sh. 1

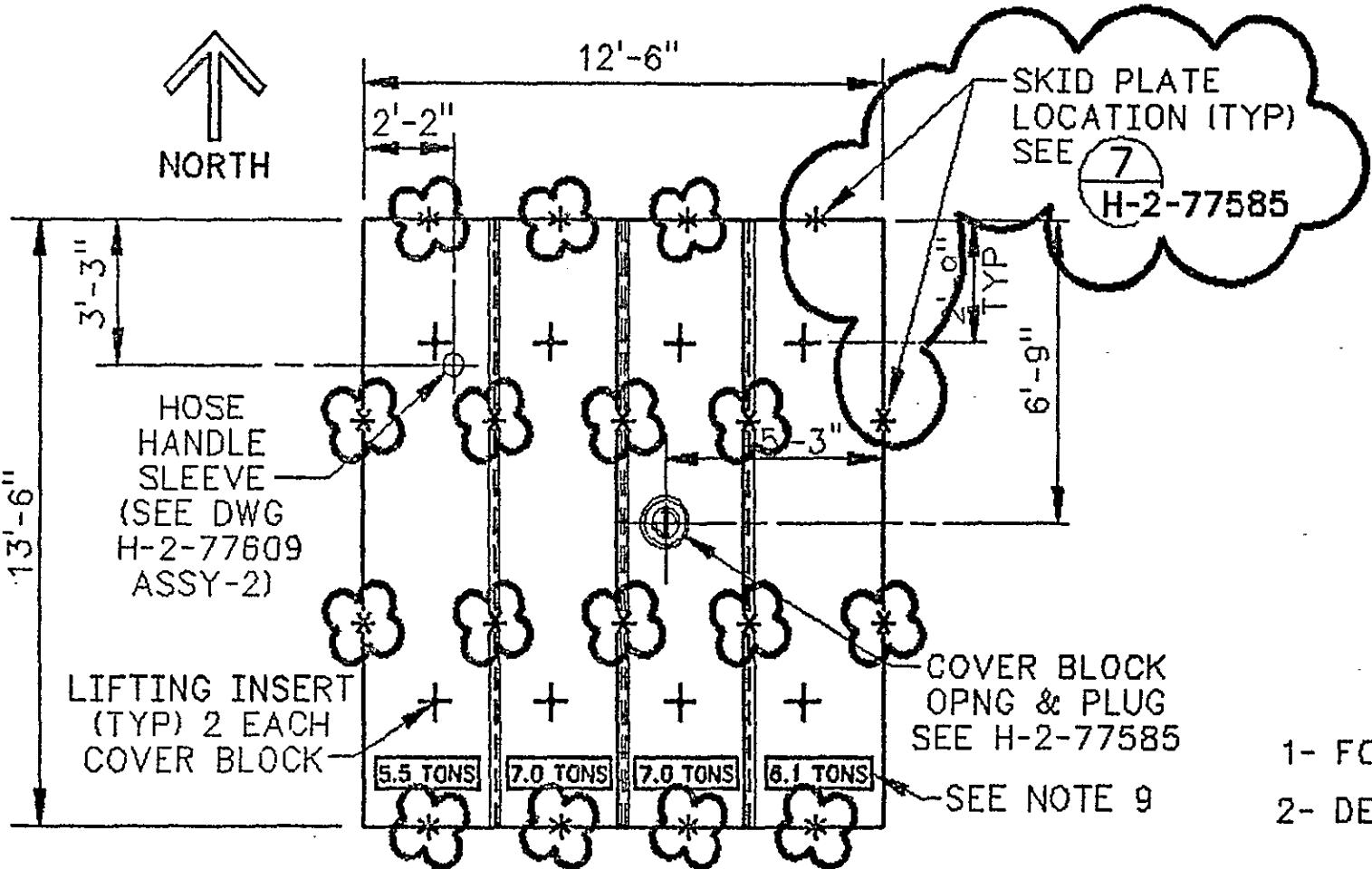
Rev. O

Prepared By
TK EHRRARDChecked By
G. Koenig

ECN No.

B-714-10

Page 9


PLAN OF COVER BLOCKS
SCALE $\frac{1}{4}''=1'-0''$ 1- FOF
2- DES

3- DES

4- APF

Ref. Dwg.
H-2-77585

Sh. 1

Rev. O

Prepared By
TK EHRHARD

Checked By

G.Koci

ECN No.

B-714-10

Page 10

TYP BAR TO ANGLE $3/16$
EMBEDDED FB $2 \times 1/4$
w/ $2-1/4 \times 2^{11/16}$ "
NELSON STUDS (TYP)

FB $1\frac{1}{2} \times \frac{1}{8}$ CENTERED
ON EMBEDDED PLATE
ADD AFTER BLOCK
FABRICATION (TYP)

$1/8$ TYP EA
END

EMBED SKID PLATE ON INCLINED SURFACE
OF EACH COVER BLOCK. THIRD POINTS ON
LONG SIDES AND CENTER POINT ON SHORT
SIDES (6 REQD PER BLOCK)

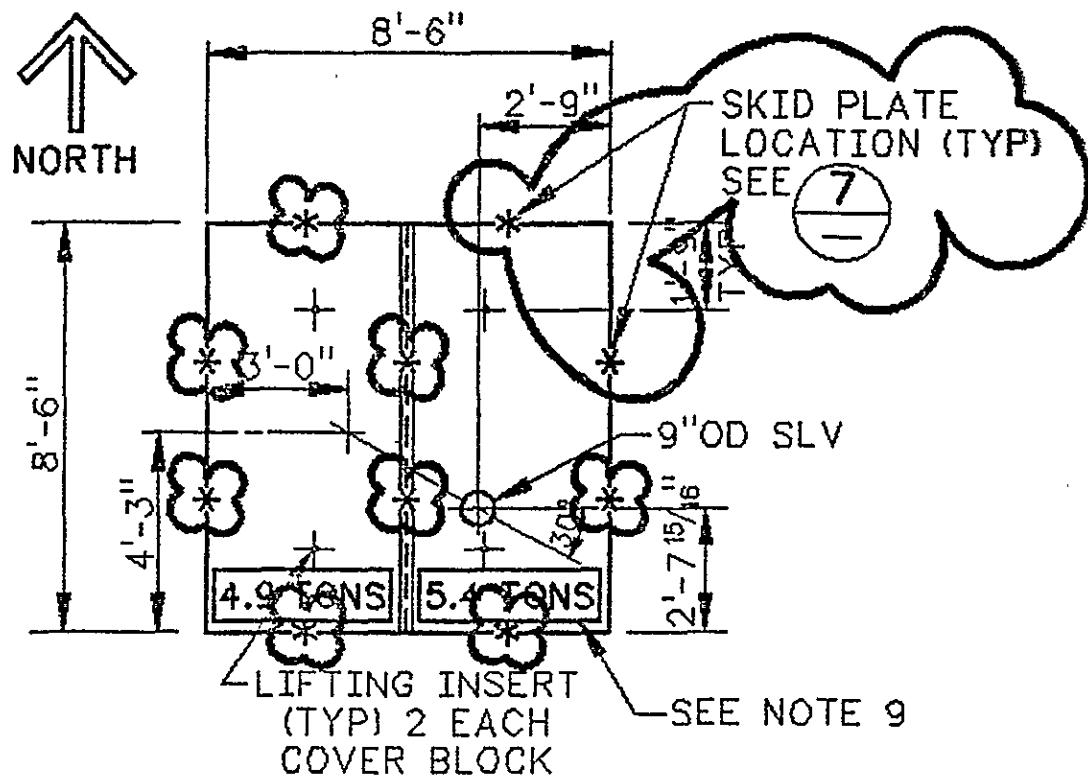
SKID PLATE DET

SCALE $3''=1'-0''$

7

H-2-77584

Ref. Dwg. H-2-77586	Sh. 1	Rev. O	Prepared By TK EHRHARD	Checked By G. Kocé	ECN No. B-714-10	Page 11
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PLAN OF COVER BLOCKS

SCALE $\frac{1}{4}''=1'-0''$

Ref. Dwg.

H-2-77586

Sh.

1

Rev.

0

Prepared By

TK EHRHARD

Checked By

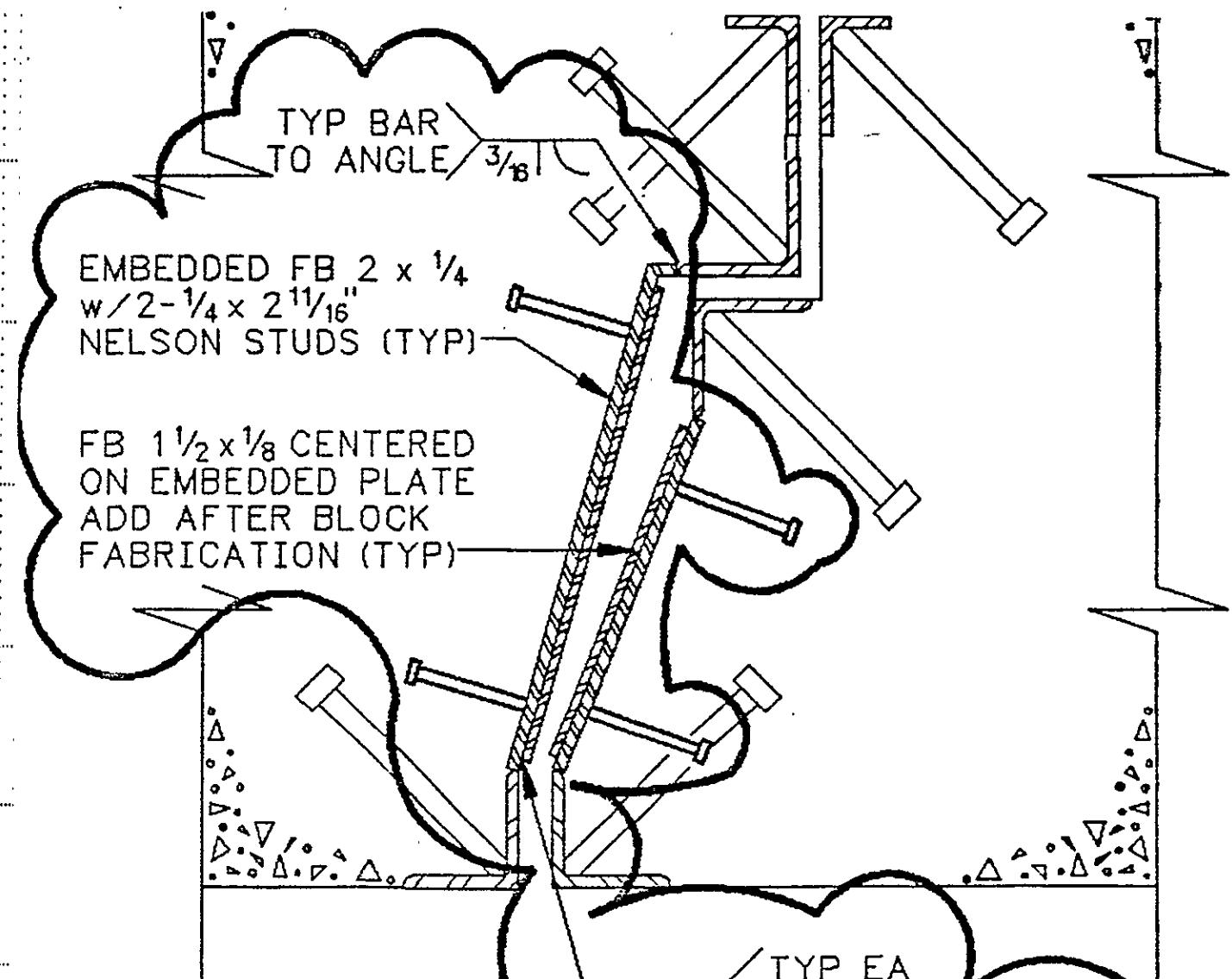
Gu Koco

ECN No.

B-714-10

Page

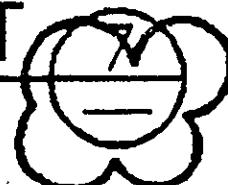
12



EMBED SKID PLATE ON INCLINED SURFACE
OF EACH COVER BLOCK. THIRD POINTS ON
LONG SIDES AND CENTER POINT ON SHORT
SIDES (6 REQD PER BLOCK)

SKID PLATE DET

SCALE 3"=1'-0"



Ref. Dwg.

Rev.

Prepared By

H-2-77586

1

Prepared by
TK EHRHARD

Checked By

Ge Koci

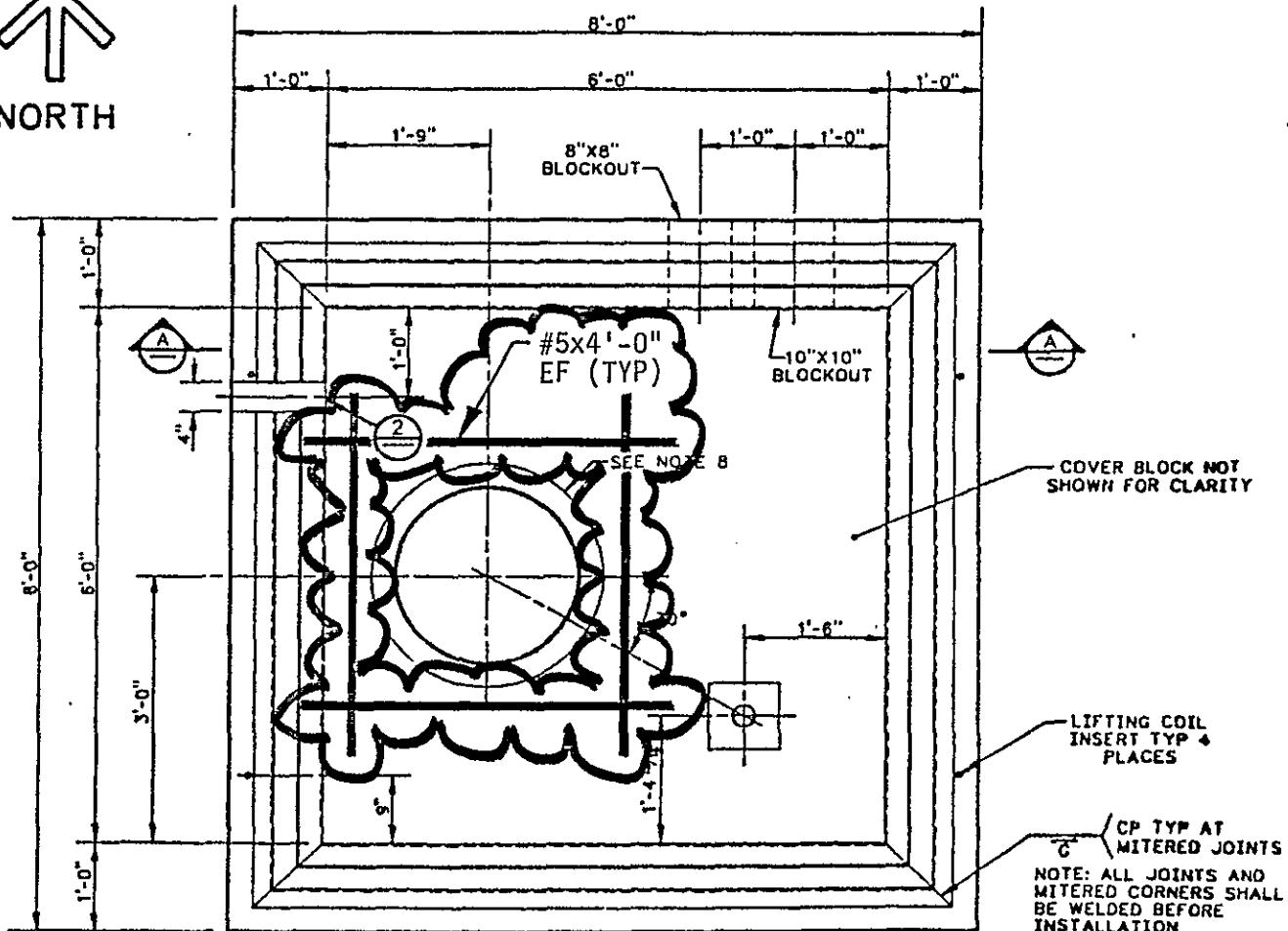
ECN No.

B-714-10

Page
13



NORTH



PLAN

SCALE 1" = 1'-0"

(SHOWN WITH COVER BLOCK REMOVED)

KAISER ENGINEERS
HANFORD

ENGINEERING CHANGE NOTICE SKETCH

Ref. DWG.

H-2-77588

Sh. 2

Rev. O

Prepared By
TK EHRHARD

Checked By
G. Koen

ECN No.
B-714-1D

Page
14

PITS

PIT NO	REF DWG NO	NORTH	WEST	CLOSURE ACTION	COMMENTS	COMP DATE
218-E-16-1C2-C	H-2-77601	W40495.25	W45550.75	SECTION E DWG H-2-77588 SH 3		
218-E-16-1C1-C	H-2-77602	W40519.00	W45484.50	SECTION C DWG H-2-77588 SH 3		
218-E-16-1C2-E	H-2-77602	W40472.50	W45484.50	SECTION C DWG H-2-77588 SH 3		
218-E-16-1C2-F	H-2-77602	W40472.50	W45610.00	SECTION C DWG H-2-77588 SH 3	.	
218-E-16-1C2-G	H-2-77602	W40519.00	W45610.00	SECTION C DWG H-2-77588 SH 3		
218-E-16-1C2-A	H-2-77612	W40496.25	W45474.00	H-2-77592		

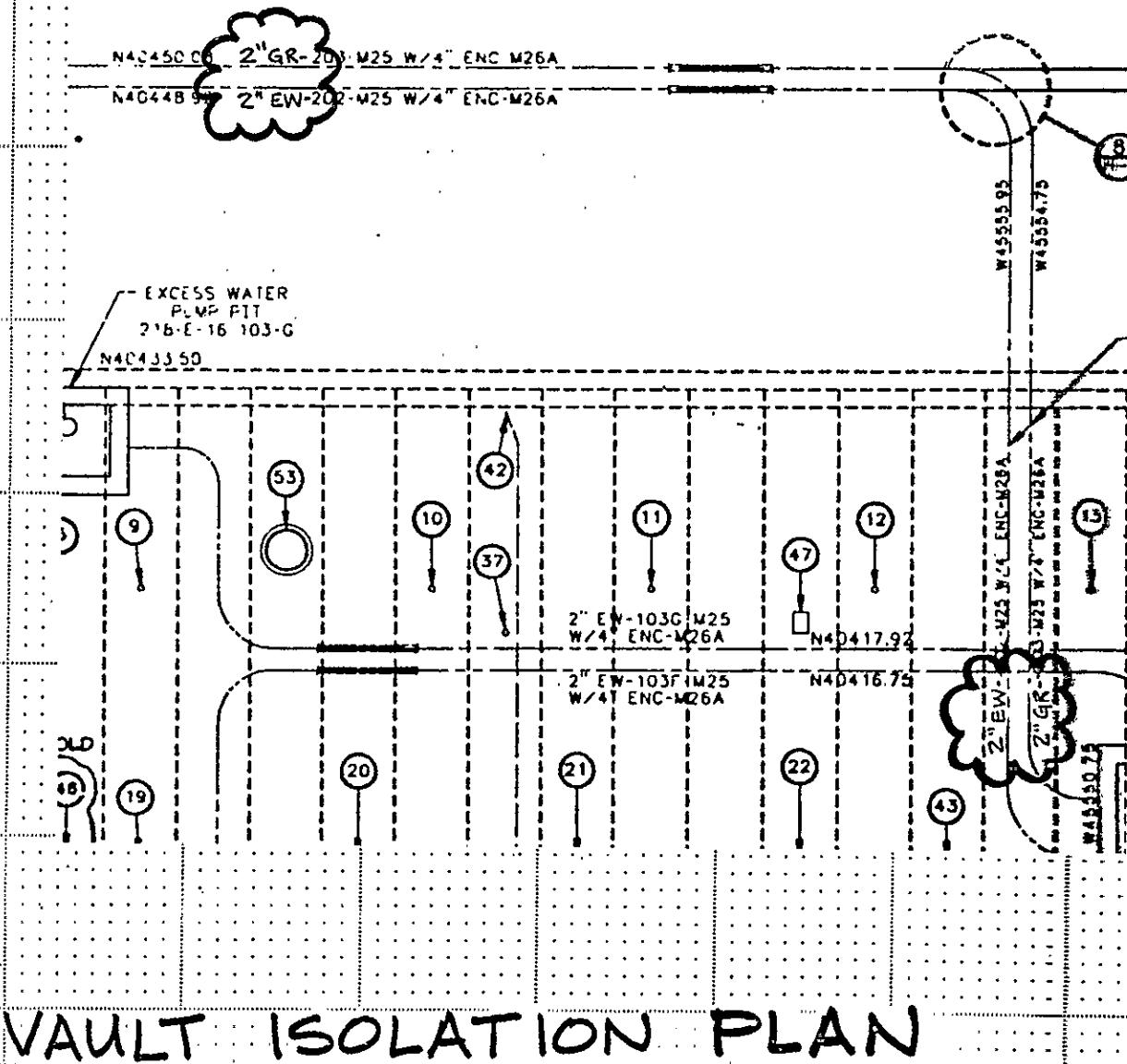
PIPING

PIPE NO	REF DWG NO	CLOSURE ACTION	COMMENTS	COMP DATE
2"EW-1C2D	H-2-77596	FILL PIPE WITH GROUT		
4"EW-1C2D ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-1C2E	H-2-77596	FILL PIPE WITH GROUT		
4"EW-102E ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-102F	H-2-77596	FILL PIPE WITH GROUT		
4"EW-102F ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-102G	H-2-77596	FILL PIPE WITH GROUT		
4"EW-102G ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"GR-202	H-2-77596	DET 1 H-2-77611 SH 1		
4"GR-1C2 ENCASEMENT	H-2-77596	DET 1 H-2-77611 SH 1		
2"EW-203	H-2-77596	DET 1 H-2-77611 SH 1		
4"EW-102 ENCASEMENT	H-2-77596	DET 1 H-2-77611 SH 1		

ELECTRICAL

ITEM	REF DWG NO	CLOSURE ACTION	COMMENTS	COMP DATE
MH-102A	H-2-77638 SH 3 DET 1	REMOVE 225 KVA XFMR CAP CONDUITS P 52 & P 53 RAISE MH COVER H-2-77592		
LEACHATE CONTROL STATION 102	H-2-77638 SH 2	RAISE LEACHATE CONTROL STATION		
LEACHATE PIT & SUMP TERMINAL BOXES	H-2-77638 SH 3 DET 5	RAISE TERMINAL BOXES		

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-77588	4	O	TK EHRHARD	G. Koe	B-714-15	15



KAISER ENGINEERS
HANFORD

ENGINEERING CHANGE NOTICE SKETCH

Ref. DWG.
H-2-77588

Sh. 5

Rev. O

Prepared By
TK EHRRHARD

Checked By
G. Kozai

ECN No.
B-714-10

Page 16

PITS

PIT NO	REF DWG NO	NORTH	WEST	CLOSURE ACTION	COMMENTS	COMP DATE
218-E-16-103-C	H-2-77601	W40412 71	W45550 75	SECTION E DWG H-2-77588 S- 3		
218-E-16-103-C	H-2-77602	W40432 51	W45484 50	SECTION C DWG H-2-77588 S- 3		
218-E-16-103-E	H-2-77602	W40386 01	W45484 50	SECTION C DWG H-2-77588 S- 3		
218-E-16-103-F	H-2-77602	W40386 00	W45610 00	SECTION C DWG H-2-77588 S- 3		
218-E-16-103-G	H-2-77602	W40432 51	W45610 00	SECTION C DWG H-2-77588 S- 3		
218-E-16-103-A	H-2-77612	W40412 25	W45474.00	H-2-77592		

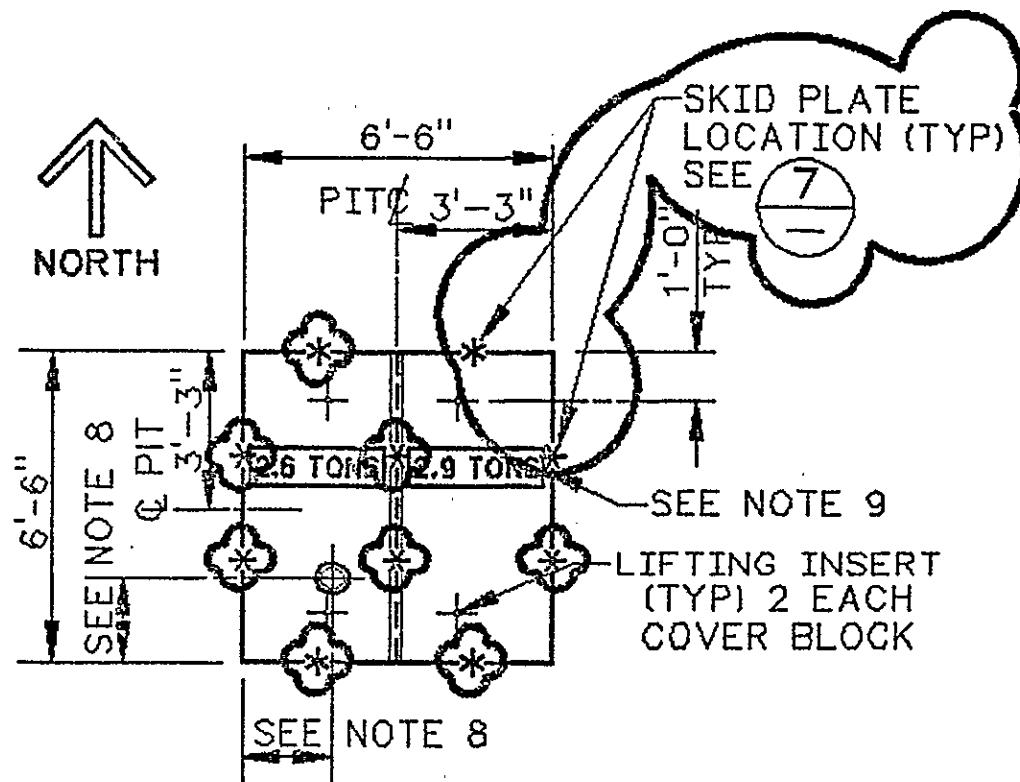
PIPING

PIPE NO	REF DWG NO	CLOSURE ACTION	COMMENTS	COMP. DATE
2"EW-103C	H-2-77596	FILL PIPE WITH GROUT		
4"EW-103D ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-103E	H-2-77596	FILL PIPE WITH GROUT		
4"EW-103E ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-103F	H-2-77596	FILL PIPE WITH GROUT		
4"EW-103F ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"EW-103G	H-2-77596	FILL PIPE WITH GROUT		
2"EW-103H ENCASEMENT	H-2-77596	FILL ANNULUS WITH GROUT		
2"GR-202	H-2-77596	DET 8 H-2-77611 SH 2		
2"EW-203	H-2-77596	DET 8 H-2-77611 SH 2		
2"EW-203 ASKED	H-2-77596	DET 8 H-2-77611 SH 2		

ELECTRICAL

ITEM	REF DWG NO	CLOSURE ACTION	COMMENTS	COMP. DATE
WH-103A	H-2-77638 SH- 3 DET 1	REMOVE 225 KVA XFMR CAP CONDUITS P 52 & P 53 RAISE WH COVER H-2-77592		
LEACHATE PUMP STATION 101	H-2-77638 SH 2	RAISE LEACHATE CONTROL STATION		
LEACHATE PIT & SUMP TERMINAL BOXES	H-2-77638 SH 3 DET 14	RAISE TERMINAL BOXES		

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-77590	I	O	TK EHRHARD	G. Koci	B-714-10	17



PLAN OF COVER BLOCKS

SCALE $\frac{1}{4}''=1'-0''$

Ref. Dwg.
H-2-77590

Sh. 1

Rev. O

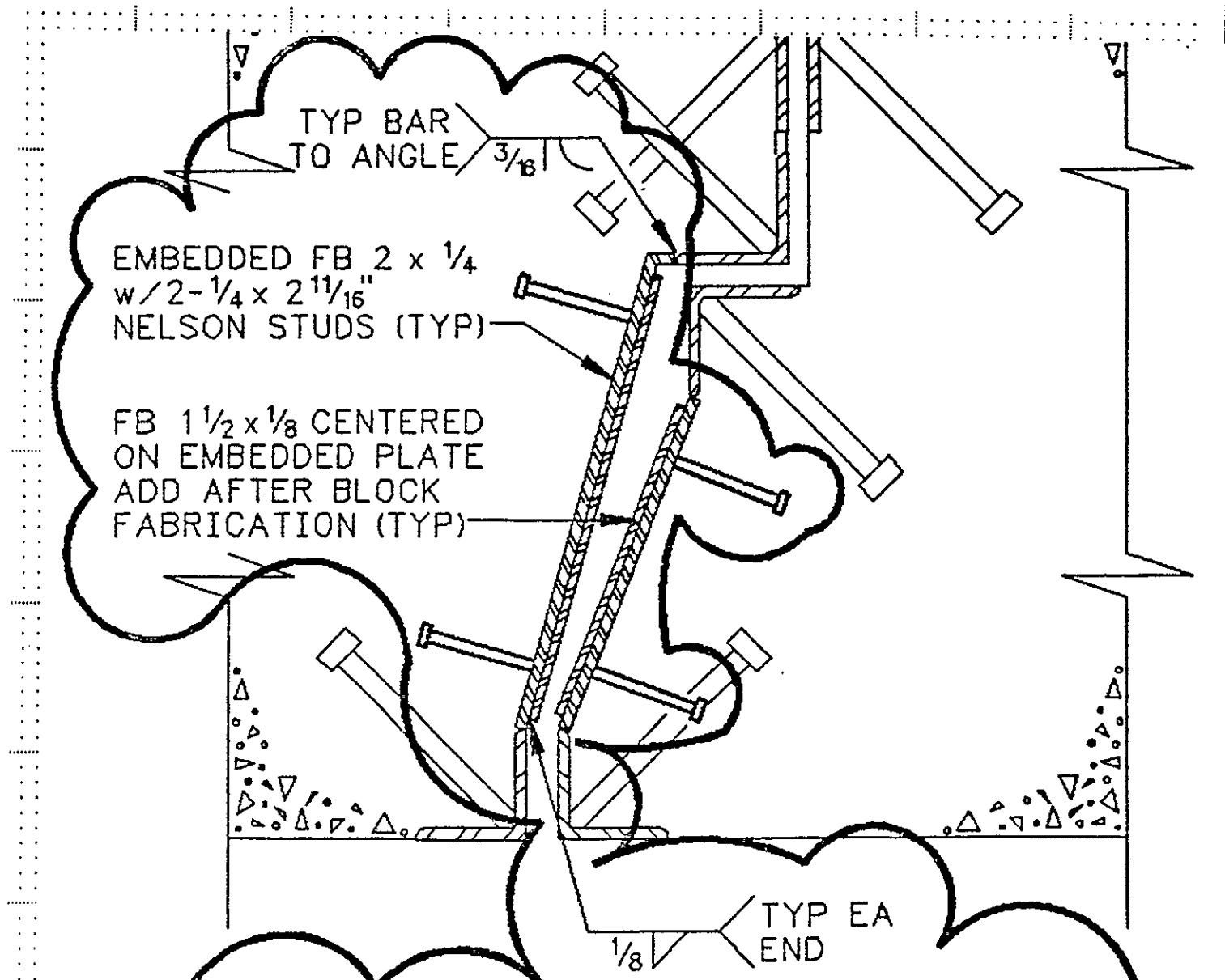
Prepared By
TK EHRHARD

Checked By

G. Kwei

ECN No.

B-714-10

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TYP BAR TO ANGLE $3\frac{1}{16}$

EMBEDDED FB $2 \times \frac{1}{4}$
w/ $2\frac{1}{4} \times 2\frac{11}{16}$ "
NELSON STUDS (TYP)

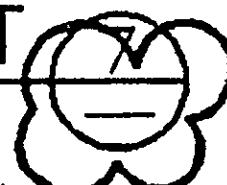
FB $1\frac{1}{2} \times \frac{1}{8}$ CENTERED
ON EMBEDDED PLATE
ADD AFTER BLOCK
FABRICATION (TYP)

$\frac{1}{8}$ TYP EA
END

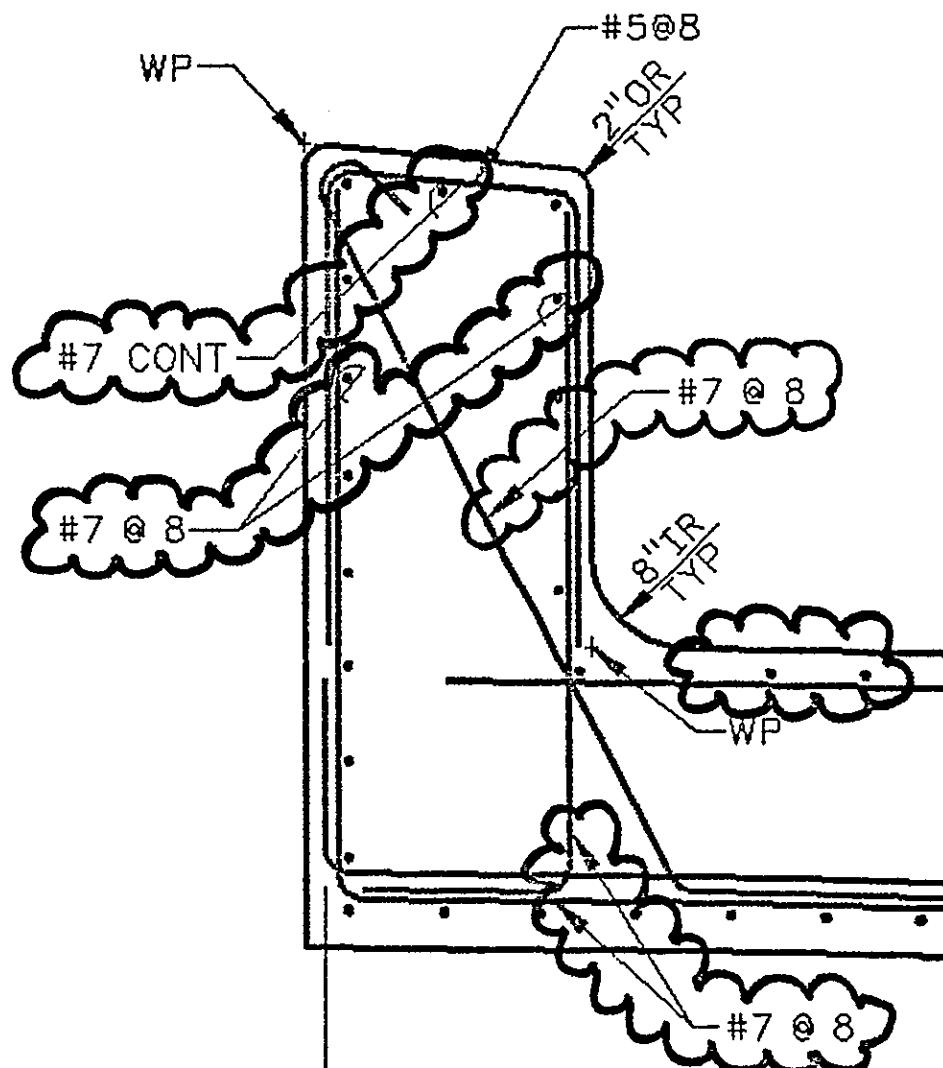
EMBED SKID PLATE ON INCLINED SURFACE
OF EACH COVER BLOCK. THIRD POINTS ON
LONG SIDES AND CENTER POINT ON SHORT
SIDES (6 REQD PER BLOCK)

SKID PLATE DET

SCALE 3"=1'-0"

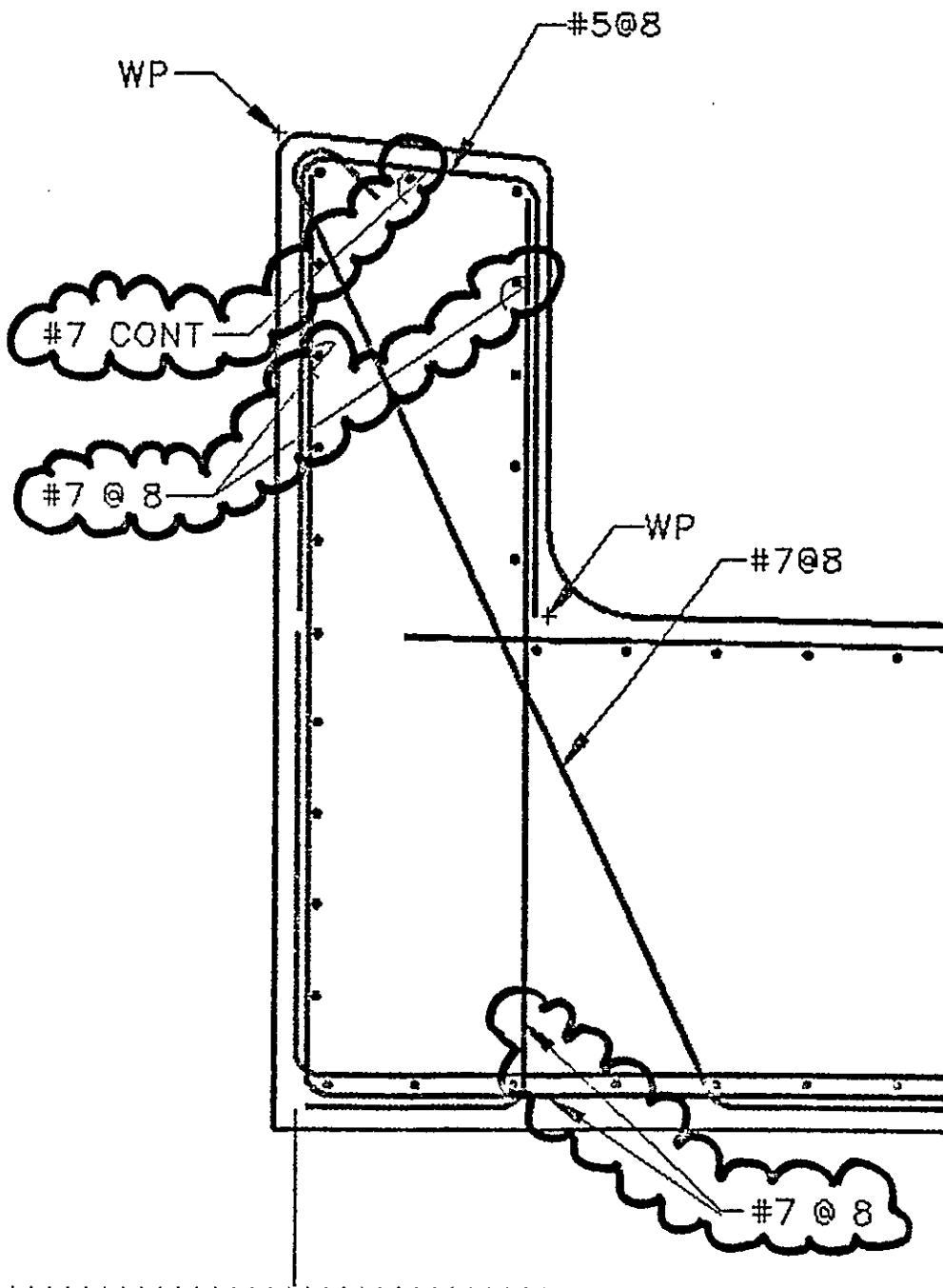


Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-77593	3	O	TK EHRHARD	G. Kosc	B-714-10	19



SECTION B

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-77593	3	O	TK EHRHARD	G. Koen	B-714-10	20



SECTION C

Ref. Dwg. See Below	Sh. -	Rev. -	Prepared By R. G. Hollenbeck	Checked By <i>John P. Ray</i>	ECN No. B-714-10	Page 21
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ENVIRONMENTAL CHANGESConstruction Specification B-714-C2Section 02755

1. 1.3.2 Change end of first sentence to read "...of HDPE liner."
2. 2.1.1.1 Add to end of sentence "or National Seal Company, Galesburg, Illinois".
3. 2.1.1.2 Delete "minimum" in first sentence.
4. 3.2.2 Add to end, "Install with sufficient slack to compensate for thermal expansion and contraction from ambient temperature variations."
5. 3.3.1.1 Change "30 psi" to "60 psi". Change "15 seconds" to "15 minutes".
6. 2.1.1.2 Change value for "Change in tensile strength at break and yield (%)" to ± 10 .
7. 2.1.1.2 Change value for Melt Flow Index from "0.3" to "1.0".
8. 3.3.2.2 Change "3083" to "638".

Section 02756

1. 2.1.2.2 Remove "Stress relieve fitting welds and bends".

Section 09885

1. 1.1 Add National Association of Corrosion Engineers (NACE) "Recommend Practice, High Voltage Electrical inspection of pipeline coatings prior to installation" to reference list.
2. 3.4.1 Change to read "TESTING".
3. 3.4.1.1 Add paragraph, "Test for wet film thickness where directed by KEH".
4. 3.4.1.2 Add paragraph, "Test entire surface for pinholes using an electrical holiday detector. Perform test in accordance with NACE Standard RP-02-74".
5. 3.4.2 Change "perform" to "witness".

H-2-77583

- 1a. Zone D4; Remove pipe slope callout.
- 1b. Zone E6; Change "2.13% SLOPE" to "SLOPE".
- 1c. Zone B5; Add to leachate removal pipe; "slope to match trench bottom".

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
Shown Below	-	-	C. R. Zook	J. A. O.	B-714-10	22

DWG H-2-77597, SH1, Rev. 0

- Change Note 6 to read "weld and examine lifting bail attachment in accordance with AWS D1.1, Section 8."

H-2-77605, SH1, Rev. 0, partial plan change "H-2-77580" to read "H-2-77593, SH2".

DWG H-2-77608, SH1, Rev. 0

- Change, Note 1 to read "...specification C2, Section 15493."

DWG H-2-77609, SH1, Rev. 0

- Change, Note 1 to read, "...specification C2, Section 15493."

B-714-C2, Rev. 0, Section 02752

- Change paragraph 2.2.2 to; "weld plastic pipe by butt fusion method IAW manufacturers recommendations."
- Change paragraph 2.3.1.1 to read "100 percent visual examination is required for fit-up, root and cover passes as noted on page 02752-8. Examine in welded condition. Acceptance criteria shall be in accordance with AWS D1.1, paragraph 8.15.1."
- Change paragraph 2.3.1.2 to read; "Perform 100 percent liquid penetrant (dye penetrant) examination (PT) on cover pass as noted on page 02752-8 and in accordance with AWS D1.1 paragraph 6.7.6 and Section 8."
- Change page 8 to liquid penetrant only on "cover pass" for "riser & pit drain" and "liner".
- Change page 8 to "C,G" on "leak/pressure" for catch basin drain & liner.

B-714-C2, Rev. 0, Section 15493

- Add to 3.1.2.5 "and install leak detection pull wire IAW section 16400, paragraph 3.2.8."
- Delete paragraph 3.1.7.4.
- Change paragraph "3.1.7.5" to "3.1.7.4."
- Add to 3.2.3.2 (C) "jumpers will be tested by others".

**KAISER ENGINEERS
HANFORD**

ENGINEERING CHANGE NOTICE SKETCH

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
See Below	-	-	W. C. Atkins		B-714-10	24

ELECTRICAL CHANGES

1. DWG H-2-77635 Sh. 1 Rev. 0 ZD2:
Delete "& 7" and the "S" from Details on
see details 5 & 7.
2. DWG H-2-77636 Sh. 2 Rev. 0 & 4 Rev. 0 ZF2:
Change SEE NOTE 5 to SEE NOTE 2.
Sh. 1 6/26/89
3. DWG H-2-77637 Rev. 0 ZE3:
Correct spelling of "REPLACE" at Detail 5.
4. DWG H-2-77638 Sh. 1 Rev. 0 ZB7
Change bottom half of Detail 8 bubble from Sh 3
to - (dash).
5. DWG H-2-77638 Sh. 3 Rev. 0 ZC5
Correct word in callout from ZING to ZINC.
6. H-2-77639 Sh. 1 Rev 0 ZD3 & E7, Sh. 2, Rev. 0 ZD4, & D5
Correct spelling of "UNTIL". (Sh. 1 ZD3, Sh. 2 ZD4).
Correct spelling of "LEACHATE" in nameplate note
(Sh. 1 ZE7, Sh. 2 ZD5).
Sh. 1 6/26/89
7. H-2-77641 Rev. 0 ZC8
Wire run number GWD89, 90 & 91
Change No. of wires from 4/C to "4-1/C"
Change size of wire from "12" to "6"
Change wire type from "2" to "1"

Revised Spec.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
B-714-C2	-	-	W. C. Atkins	<i>[Signature]</i>	B 714- 10	25

Electrical Changes

Specifications B:714-C2

Section 16300

1. Add: 3.2.5.4 Maximum pulling tension on conductors:
Recommended by manufacturer.
2. 2.2.2. Add to end: "Transformer oil to be certified PCB free."
3. Vendor data list (page 16300-12) in Certified Vendor Information for Transformer add an "X" under Dimensional Drawings, Equipment weight & Specifications.
4. 2.2.5 Add to end: Manhole cover shall be embossed with the words "HIGH VOLTAGE ELECTRIC"
5. ~~3.2.1.3 Change "Use appropriate special tools..." to Use appropriate calibrated special tools...~~ *[Signature]*

Section 16400

6. 2.1.3 Change to read: "Conductors: #10 and 12 AWG conductors for power branch circuits shall be solid copper. #8 AWG conductors and larger shall be stranded copper. Type and AwG size as specified on the drawings.
7. 3.2.6.4 Change: , "in accordance with the Drawings" to ", in accordance with the following"
Change "a" to:
 - a. For three phase circuits:
Phase A-Red or marked red.
Phase B-Yellow or orange or marked yellow.
Phase C-Blue or black.
Neutral-White or grey only, #6 and smaller or marked white larger than #6.
Equipment Ground-Green or bare copper wire for #1 to #4/0.
 - b. For single phase circuits:
Number 1, Hot-Black only.
Number 2, Hot-Red or marked red.
Neutral-White or grey only, #6 and smaller or marked white larger than #6.
Equipment Ground-Green or bare copper wire for #1 to #4/0.

KAISER ENGINEERS HANFORD COMPANY
P. O. Box 888
Richland, Washington 99352

REQUEST FOR PROPOSAL NO.: KEH-5162 (B-714)
DATE OF ISSUE: May 5, 1989
DATE BIDS DUE (STEP TWO): July 7, 1989

June 30, 1989

ADDENDUM NO. 5

VAULT CONCRETE BASIN, SHELL, AND LEACHATE SUMP FOR GROUTED WASTE
DISPOSAL FACILITIES, 200-EAST AREA, HANFORD SITE,
RICHLAND, WASHINGTON

Request for Proposal No. KEH-5162 (B-714) dated May 5, 1989 for subject work is hereby modified as follows:

1. Construction Specification No. B-714-C2, Revision 0 is modified as noted in the attached Engineering Change Notice B-714-12 dated June 29, 1989.

Receipt of this addendum shall be acknowledged on the Bid Form in the space provided therefor. Failure to acknowledge receipt of all addenda may be cause for rejection of your bid.

KAISER ENGINEERS HANFORD COMPANY


M. A. Colby
Contract Administrator

MAC:mj

Attachment
ECN B-714-12

ENGINEERING CHANGE NOTICE

Page 1 of 9

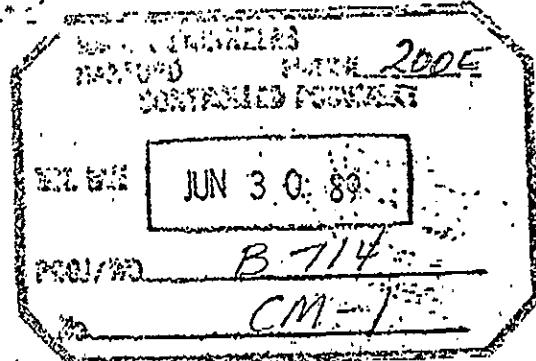
1. ECN 110157Proj. ECN B-714-12

2. ECN Category (mark one)		3. Originator's Name, Organization, MSIN, and Telephone No. T. D. HAYS KEH 3-3560 TRL 57A/200E <i>T. D. Hays by SP</i>		4. Date 6-29-89
<input type="checkbox"/> Supplemental	<input checked="" type="checkbox"/> Direct Revision	5. Project Title/No./Work Order No. ER 8007.12 218-E-16 GROUTED WASTE DISPOSAL FAC		6. Bldg./Sys./Fac. No. N/A
<input type="checkbox"/> Change ECN	<input type="checkbox"/> Temporary	8. Document Number Affected (include rev. and sheet no.) <i>371402-003</i> S1-501		7. Impact Level <u>3</u>
<input type="checkbox"/> Supercedure	<input type="checkbox"/> Discovery	9. Related ECN No(s). SPECIFICATION B-714-C2, Rev 0		10. Related PONO. N/A
<input type="checkbox"/> Cancel/Void		11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	11b. Work Package Doc. No. N/A	11c. Complete Installation Work N/A Cog. Engineer Signature & Date
				11d. Complete Restoration (Temp. ECN only) N/A Cog. Engineer Signature & Date

12. Description of Change

SPECIFICATION B-714-C2, SECTION 01400, ARTICLE 1.3.1.4

ADD SUBPARAGRAPH C PER THE ATTACHED PAGES



THIS CHANGE HAS NOT BEEN DESIGN VERIFIED BY KEH

13a. Justification (mark one)	13b. Justification Details	
<input type="checkbox"/> Criteria Change		
<input type="checkbox"/> Design Improvement		
<input type="checkbox"/> Environmental		
<input type="checkbox"/> As-Found		
<input type="checkbox"/> Facilitate Const.		
<input type="checkbox"/> Const. Error/Omission		
<input type="checkbox"/> Design Error/Omission		
14. Distribution (include name, MSIN, and no. of copies)		
KHC DISTRIBUTION		
KEH DISTRIBUTION	S. R. Briggs	R3-43
Engrg Doc Cntl	J. L. Gilbert	R3-46
Const Doc Cntl	O. A. Halverson	R3-09
	J. R. McGee	S1-54
	D. E. Palmer	R3-43
	A. E. Young	S0-05
	Project Files	R1-28
	DOE	
	A. G. Lassila	A5-18
RELEASE STAMP		

**KAISER ENGINEERS
HANFORD****ENGINEERING CHANGE NOTICE SKETCH**

Ref. Dwg. Spec B-714-C2	Sh. --	Rev. --	Prepared By T. D. Hays	Checked By <i>T. D. Hays 6/30/89</i>	ECN No. B-714-12	Page 3 of 9
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Section 01400

1.3.1.4

c. The listed items are considered "Commercial Grade Items" (CGI) and the requirements for implementing as part of the QAP include:

1) If an alternate or substitute item is requested, an evaluation will be performed by KEH to determine if the substitute item meets the design criteria or function.

2) Where determined necessary by the Contractor, source evaluation and selection shall be performed.

3) Commercial Grade Items shall be identified in the purchase order by the manufacturer's published product description and/or part number.

4) Commercial grade items shall be receipt inspected to determine:

- .. Damage was not sustained during shipment.
- .. Item received was the item ordered.
- .. Inspection and testing is accomplished as required to assure conformance with the manufacturer's published requirements.
- .. Documentation as applicable to the item is received and is acceptable.

5) Additional testing and/or verification as required by other Sections of the specifications.

Only those items listed are considered "CGI". All other items, components, and materials shall be procured in accordance with the Contractors QAP which shall require suppliers to have QAPs consistent with the applicable elements of this Section, Article 1.3 and requires the Contractor to perform appropriate source evaluation and selection.

ECN-B714.ENG.1946

**KAISER ENGINEERS
HANFORD**

ENGINEERING CHANGE NOTICE SKETCH

Ref. Dwg. Spec B-714-C2	Sh. --	Rev. --	Prepared By T. D. HAYS	Checked By <i>C. Koen</i>	ECN No. B-714-12	Page 4 of 9
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Commercial Grade Items

- . 02200/2.1.3 Plastic Sheet Marker
- . 02752/2.1.4 Tapecoat 20
- . 03300/2.1.1.3 Air Entrainment
- 2.1.2.3 Tie Wire
- 2.1.3 Nonshrink Grout
- 2.1.4 Forms
- 2.1.5 Lifting Inserts and Plates
- . 05500/2.1.6 Weld Studs
- . 09805/2.1 Coating Materials
- . 09885/2.1.1 Coating Materials
- . 15493/2.1.2 Pipe Joint Sealant
- 2.1.3.2 Tape Coat 20 *or 23 4/20/67*
- 2.1.5 Polyurethane Foam
- 2.1.6 Flexible Duct Liner
- . 16300/2.1.2.1 Conduit
- 2.1.2.2 PVC on Rigid Steel Conduit
- 2.1.2.3 Conduit Fittings
- 2.1.2.3 Watertight Conduit Fittings
- 2.1.4 Wiremarkers
- 2.1.5 Nameplates
- 2.1.6 Wire Pulling Compound
- 2.1.7.1 Plastic Insulating Tape
- 2.1.7.2 Conduit Protection Tape

ECH-B714.ENG.1946

KAISER ENGINEERS HANFORD			ENGINEERING CHANGE NOTICE SKETCH			
Ref.Dwg. Spec B-714-C2	Sh. --	Rev. --	Prepared By T. D. HAYS	Checked By G. Kocé	ECN No B-714-12	Page 5
<p>2.1.7.3 Silicon Rubber Termination Tape</p> <p>2.1.8 Insulating Putty</p> <p>2.1.9 Tie Wires</p> <p>2.1.11 Wood Poles</p> <p>2.2.1 Equipment Enclosures</p> <p>2.2.4 Overhead Lightning Arresters</p> <p>2.2.5 Manholes</p> <p>16400/2.1.2.1 Conduit</p> <p>2.1.2.2 PVC Coating of Rigid Steel Conduit</p> <p>2.1.2.3 Conduit Fittings</p> <p>2.1.2.4 Flexible Conduit Fittings</p> <p>2.1.2.5 Watertight Conduit Fittings</p> <p>2.1.5 Wiremarkers</p> <p>2.1.6 Nameplates</p> <p>2.1.7 Concrete and Masonry Anchors</p> <p>2.1.8 Wire Pulling Compound</p> <p>2.1.9.1 Plastic Insulating Tape</p> <p>2.1.9.2 conduit Protection Tape</p> <p>2.1.10 Insulating Putty</p> <p>2.1.11 Duct Sealing Compound</p> <p>2.1.13 Conduit Hangers</p> <p>2.1.14 Sealant</p> <p>2.2.1 Equipment Enclosures</p> <p>2.2.2.3 Terminal Covers</p>						

ECN-B714.ENG.1946

KEM-0159.00 (1/88)

**KAISER ENGINEERS
HANFORD****ENGINEERING CHANGE NOTICE SKETCH**

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Spec B-714-C2	--	--	T.D. HAYS	G-Koch	B-714-12	6

- 16640/2.1.1 Solderless Terminal Lugs
- 2.1.1.1 Connector for #8 AWG Conductor and Smaller
- 2.1.1.2 Connector for #6 AWG Conductor and Larger
- 2.1.2 Compression Splice Connectors
- 2.1.3 Exothermic Fusion Weld Mold
- 2.1.3.1 Exothermic Weld Metal
- 2.1.4 Ground Clamp Connector
- 2.1.5 Conduit
- 2.1.6.1 Type "CP" Conductors
- 2.1.6.2 Type THHN/THWN Conductors
- 2.1.7 Conductor Splice Kit
- 2.1.8.1 Plastic Insulating Tape
- 2.1.8.2 Electrical Splice Insulating Tape
- 2.1.8.3 Electrical Color Coding Tape
- 2.1.10 Conductor Plastic Marker Plate
- 2.1.11 Cable Tie
- 2.1.12 Black Marking Pen
- 2.1.13 Equipment Nameplate
- 2.1.14 Cable Markers
- 2.2.1 Anodes
- 2.2.1.1 Cable to Anode Connection
- 2.2.1.2 Canister
- 2.2.1.3 Cure Breeze

ECN-B714.ENG.1946

**KAISER ENGINEERS
HANFORD****ENGINEERING CHANGE NOTICE SKETCH**

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pec B-714-C2	--	--	T.D. HAYS	G. Koss	B-714-12	7 of 9

- 2.2.2 Anode Junction Box, Test Station Enclosures
- 2.2.3 Anode Junction Box
- 2.2.4 Test Station
- 2.2.5 Reference Electrode

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**KAISER ENGINEERS
HANFORD**

ENGINEERING CHANGE NOTICE SKETCH

Ref. Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Page
Spec B-714-C2	--	--	T.D. HAYS	G. Koenig	B-714-12	8 of 9

- H-2-77586 Adhesive gasket
- H-2-77637 Enclosures/boxes
Terminal blocks
- H-2-77638, Sh 1 P1000 unistrut/carbon conduit spacer
- H-2-77638, Sh 2 Universal hanger
Enclosures - Thomas & Betts
Wireway and fittings
Framing channel
- H-2-77638, Sh 3 P1000 unistrut
Backplates
Pull boxes
Pin insulator
Bolts
Lag screws
Pole bracket
Kover-guard molding
Galvanized ground rod
XFMR Hold down nuts and bolts
Ground conductor
- H-2-77639, Sh 1 Horn
Sh 2 Terminal blocks
Fuse blocks and fuses
Selector switch
Pull boxes
16 by 12 by 6 inch enclosure
- H-2-77640, Sh 1 P1001 unistrut
10 by 8 by 4 inch enclosure
Fuse block and fuses
- H-2-77646 Conduit sealing fitting
Chico X fiber
Chico A compound
Copper bars
Metal hold down clamps
No. 4 bare copper ground
Ground lug
Reflective tape

ECN-B714.ENG.1946

KEH-0159 00 (1/88)

**KAISER ENGINEERS
HANFORD****ENGINEERING CHANGE NOTICE SKETCH**

Ref. Dwg. Spec B-714-C2	Sh. --	Rev. --	Prepared By T.D.HAYS	Checked By G.Koch	ECN No. B-714-12	Page 9 of 9
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- H-2-77647 Wood plank
 Coal tar (note 3)
 Woven glass fiber (note 3)
 Compression splice connectors
- H-2-77648 2 by 12 inch wood plank

ECN-B714.ENG.1946